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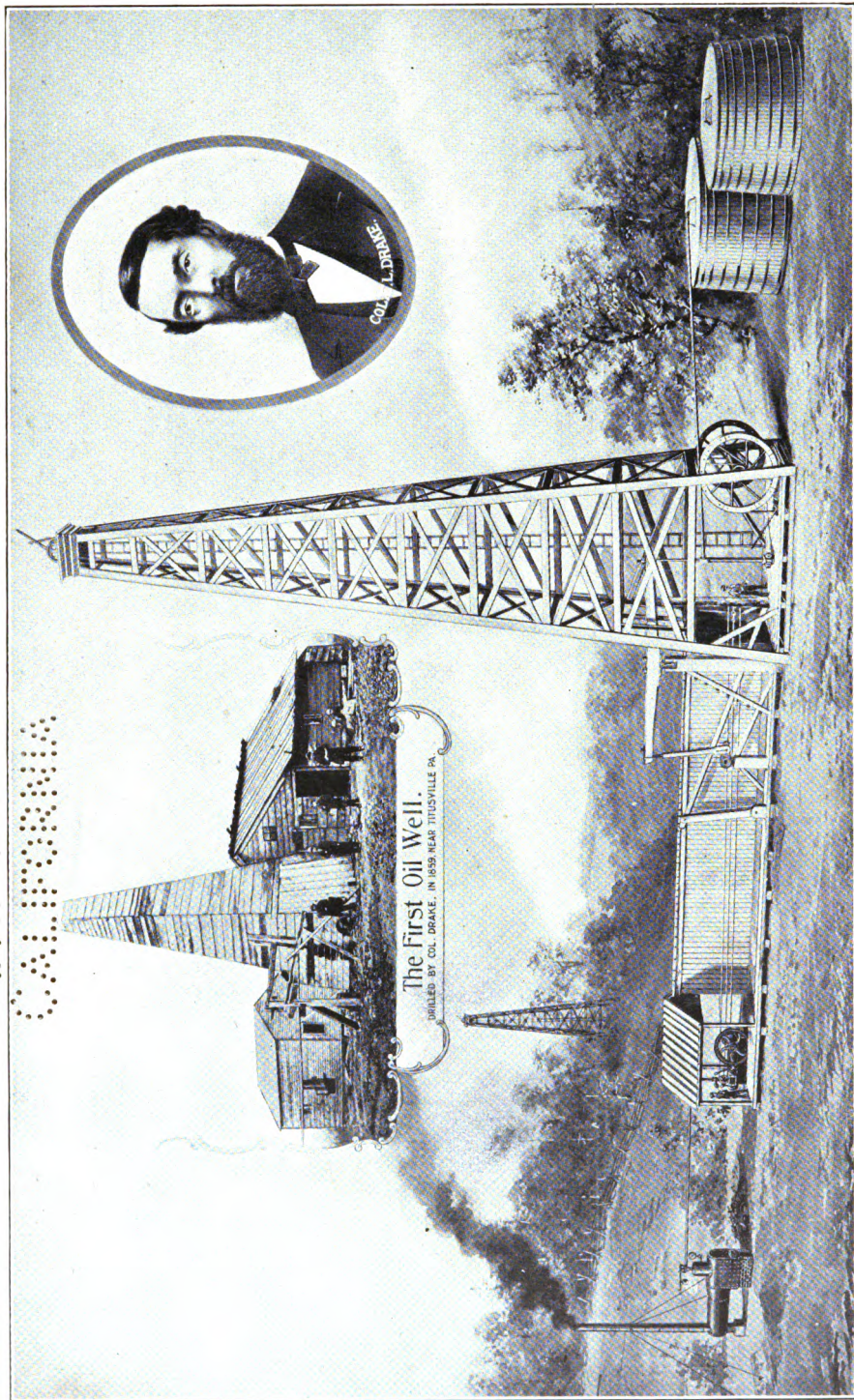
LANZAROTE  
*Caliente*.COM



1859

THE "OLD" AND "THE NEW"

1907



THE FIRST OIL WELL  
Height of Derrick - - - - 34 feet

MODERN OIL WELL  
Height of Derrick - - - - 82 feet

# WELL-DRILLING MACHINERY AND TOOLS

No. 21

SECTION  
A  
OF PRICE LIST

OIL WELL SUPPLY CO.

MAIN OFFICES

PITTSBURGH, PA., U. S. A.



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TO THE  
MEMORIAL

COPYRIGHT 1907  
By  
OIL WELL SUPPLY CO.

IN MEMORIAM  
E. O'Neill

The Lakeside Press  
R. R. DONNELLEY & SONS COMPANY  
CHICAGO

## FACTORIES

Pittsburgh, Pa.

Oswego, N. Y.

Oil City, Pa.

Parkersburg, West Va.

Bradford, Pa.

Poplar Bluff, Mo.

Memphis, Tenn.

## BRANCH STORES

In all Petroleum Districts

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Illustrated price lists issued by the Company

### SECTION A.—Well-Drilling Machinery and Tools

SECTION B.—Gas Well and Pipe Line Equipment.

SECTION C.—Steam and Water Fittings

SECTION D.—Hydraulic Rotary Drilling Outfit.

SECTION E.—Pumping-Well Supplies.

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Telegraph Address: Eaton, Pittsburgh

## CODES

A. B. C. 4th and 5th Editions

Lieber's Standard

A. 1.

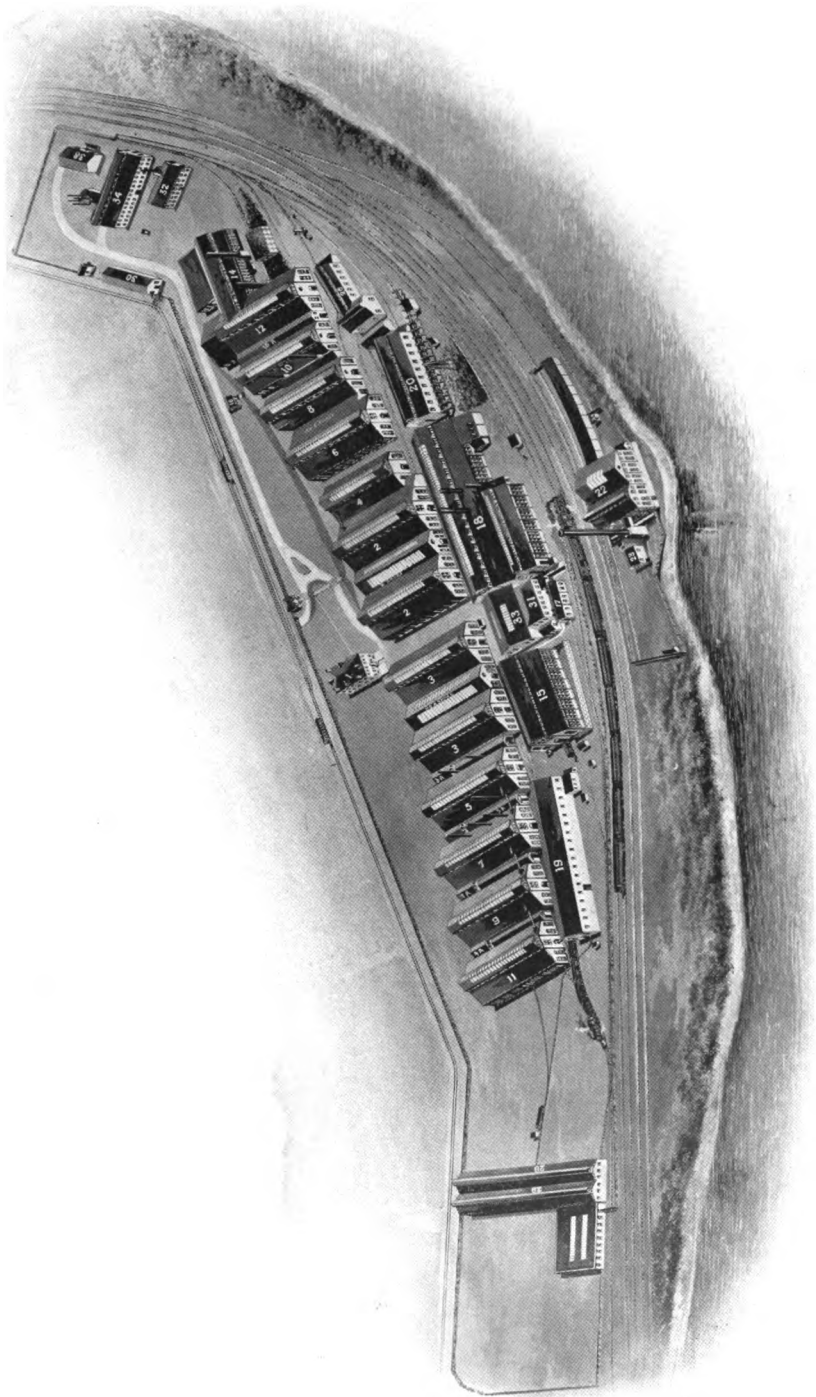
Western Union

O. W. S. Co.'s Private Code

922902







IMPERIAL WORKS, OIL CITY, PA.

Steam Engines, Gas Engines, Cast and Malleable Iron Goods and Drop Forge Work.



# Description of the New Manufacturing Plant of the Oil Well Supply Company, Known as the "Imperial Works," Located at Oil City, Pa., About One Mile From the Center of the City, on Line of Electric Railway.

The plot of ground comprises nearly forty-five acres, of which about twenty-five acres are devoted to manufacturing purposes, the balance for dwelling house sites.

The works are located on the Allegheny River, on the lines of the Pennsylvania, Lake Shore and Michigan Southern, and Erie railroad systems.

The ground devoted to manufacturing purposes covers a distance of about twenty-seven hundred feet in length, along the railroad and river, and several hundred feet in width.

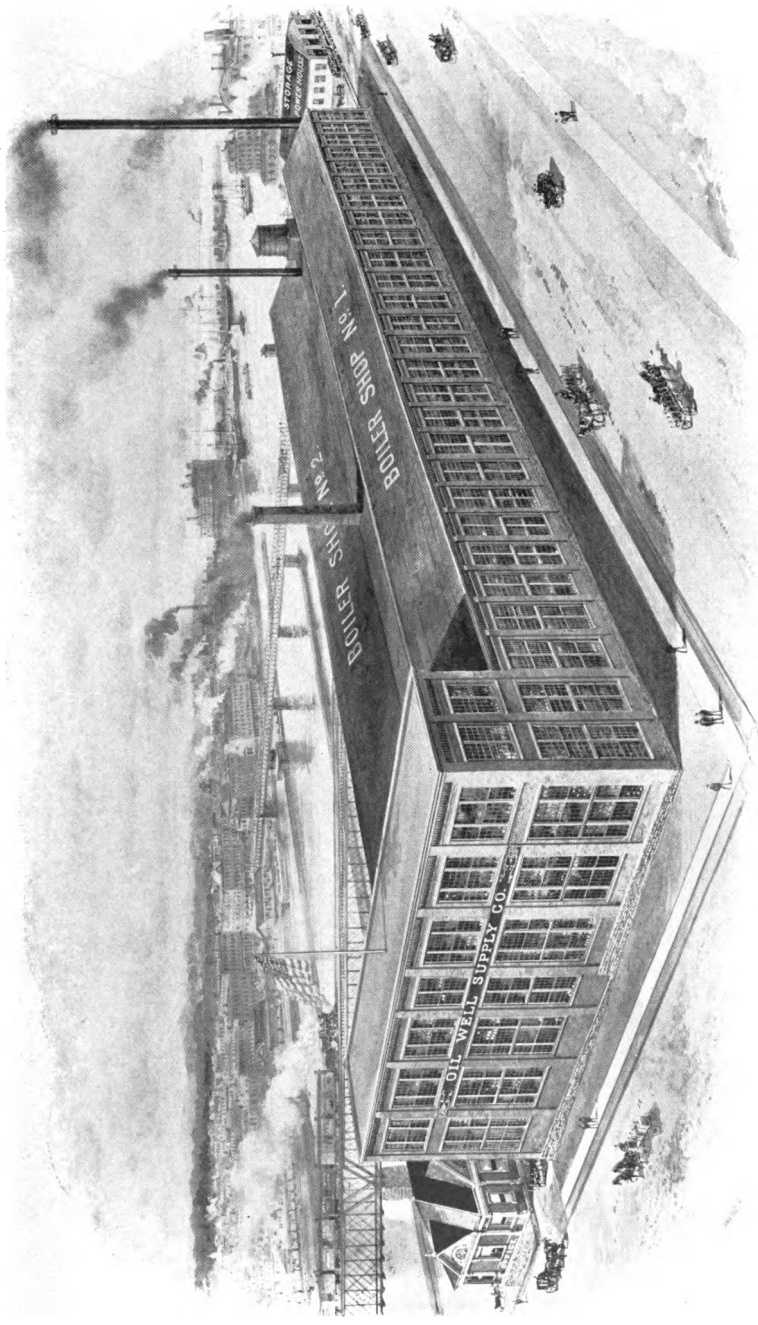
There are nearly forty buildings devoted to manufacturing purposes, mostly one story in height, constructed of steel and brick with slate roofs, all well lighted and ventilated.

The size of each building, and the purpose for which it is designed, are as follows: (See illustration.)

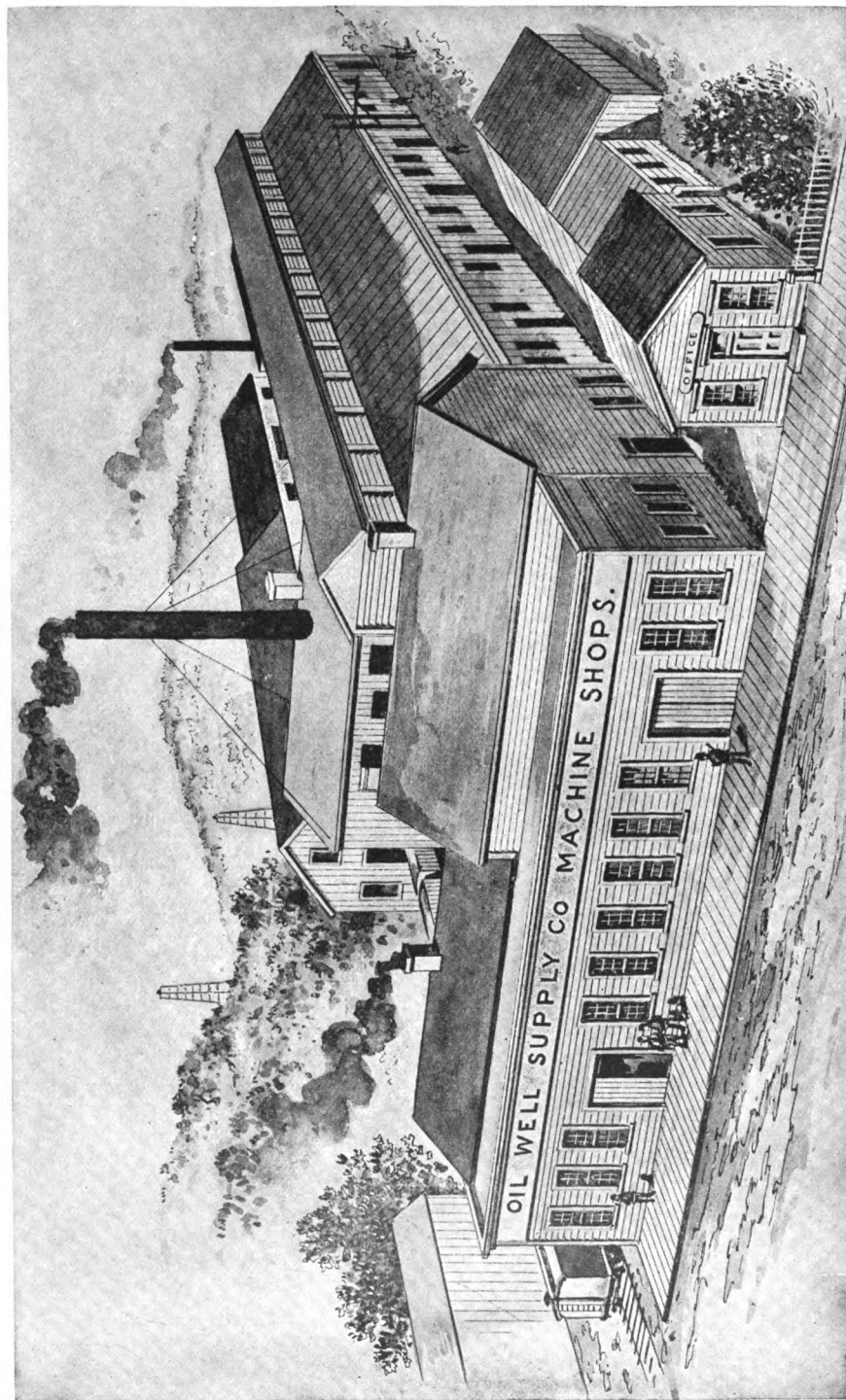
|             |                                                | FEET                |               |
|-------------|------------------------------------------------|---------------------|---------------|
| No. 1.      | Office Building - - - - -                      | 50 x 75             | Three Stories |
| " 2.        | Engine Works and Machine Shop - - - - -        | 150 x 200           |               |
| " 2 Annex.  | Engine Works Storage - - - - -                 | 22 x 150            |               |
| " 3.        | General Manufacturing Department - - - - -     | 150 x 200           |               |
| " 3 Annex.  | Storage - - - - -                              | 22 x 134            |               |
| " 4.        | Pattern Shop - - - - -                         | 50 x 130            |               |
| " 5.        | Blacksmith Shop - - - - -                      | 75 x 150            |               |
| " 5 Annex.  | Storage - - - - -                              | 22 x 134            |               |
| " 6.        | Pattern Storage - - - - -                      | 75 x 150            |               |
| " 6 Annex.  | Storage - - - - -                              | 27 x 134            |               |
| " 7.        | Drop Forge Department - - - - -                | 75 x 150            |               |
| " 7 Annex.  | Storage - - - - -                              | 22 x 134            |               |
| " 8.        | Fittings Tapping Department - - - - -          | 50 x 150            |               |
| " 9.        | Iron Rod Department - - - - -                  | 75 x 150            |               |
| " 9 Annex.  | Storage - - - - -                              | 22 x 134            |               |
| " 10.       | Annealing - - - - -                            | 50 x 150            |               |
| " 10 Annex. | Storage - - - - -                              | 22 x 150            |               |
| " 10 Annex. | Sorting and Grinding - - - - -                 | 14 x 111            |               |
| " 11.       | Sucker Rod Department - - - - -                | 75 x 150            |               |
| " 12.       | Malleable Iron Foundry - - - - -               | 75 x 190            |               |
| " 14.       | Malleable Iron Foundry - - - - -               | 120 x 50            |               |
| " 14 Annex. | " " " } Joined - - - - -                       | 100 x 40            |               |
| " 15.       | Portable Drilling Rigs - - - - -               | 75 x 150            |               |
| " 16.       | Malleable Iron Department Office - - - - -     | 16 x 24             |               |
| " 17.       | Locomotive House - - - - -                     | 18 x 70             |               |
| " 18.       | Gray Iron Foundry - - - - -                    | 75 x 300            | and 50 x 150  |
| " 19.       | Raw Stock Storage - - - - -                    | 40 x 280            |               |
| " 20.       | Foundry Storehouse - - - - -                   | 50 x 150            |               |
| " 22.       | Power House - - - - -                          | 75 x 100            |               |
| " 23.       | Lumber Storage - - - - -                       | 22 x 32             |               |
| " 26.       | Galv. Department and Cooper Shop - - - - -     | 30 x 80 and 40 x 52 |               |
| " 29.       | General Storage and Shipping Dept. - - - - -   | 76 x 234            |               |
| " 29 Annex. | " " " " - - - - -                              | 77 x 126            |               |
| " 30.       | Sand Shed - - - - -                            | 29 x 80             |               |
| " 31.       | Rattling Room for Gray Iron Dept. - - - - -    | 35 x 70             |               |
| " 32.       | Malleable Iron Pattern Storage - - - - -       | 32 x 70             | Two Stories   |
| " 33.       | Drilling Machine Department - - - - -          | 60 x 100            |               |
| " 34.       | Malleable Iron Department, Core Room - - - - - | 40 x 132            | Two Stories   |
| " 38.       | Paint Storage - - - - -                        | 37 x 50             |               |

Total Floor Area, 360,000 square feet.

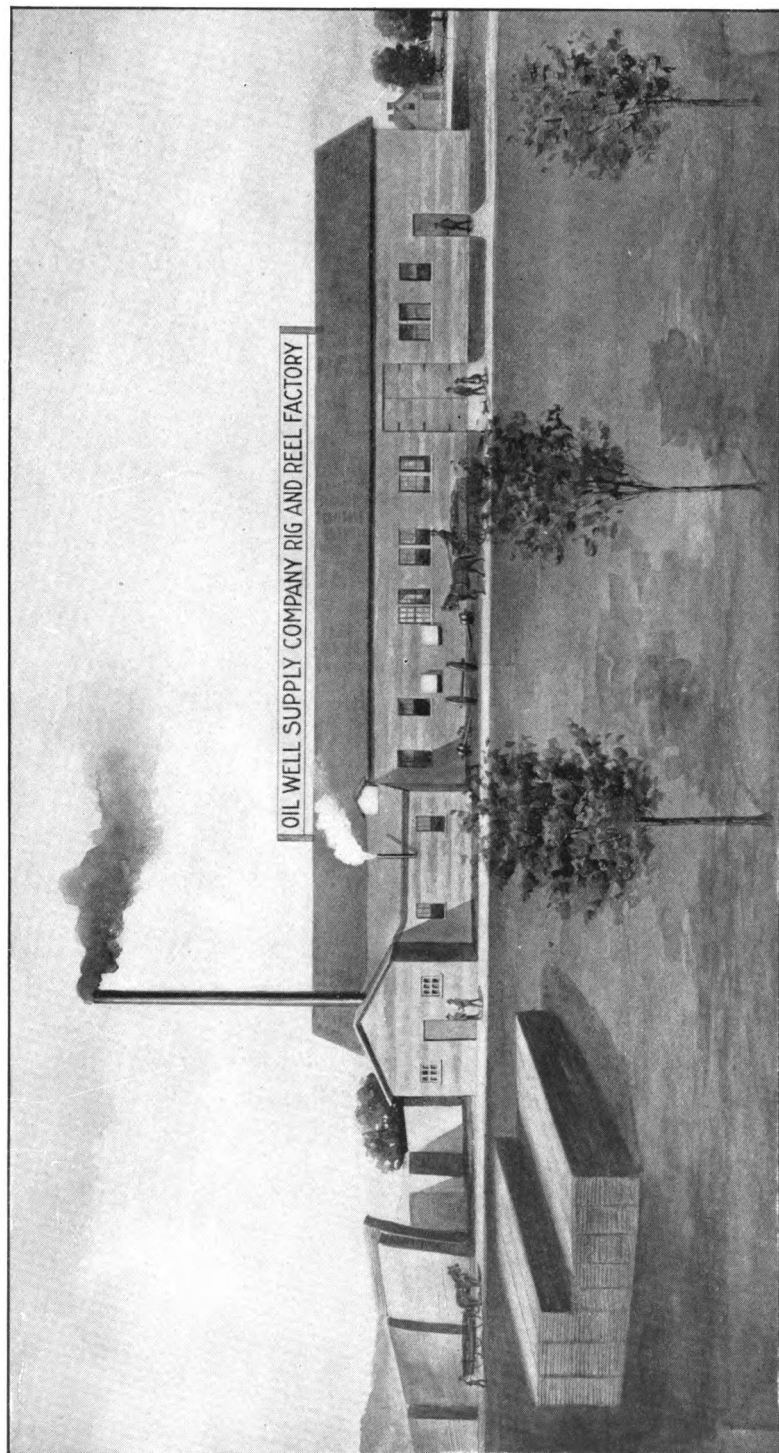




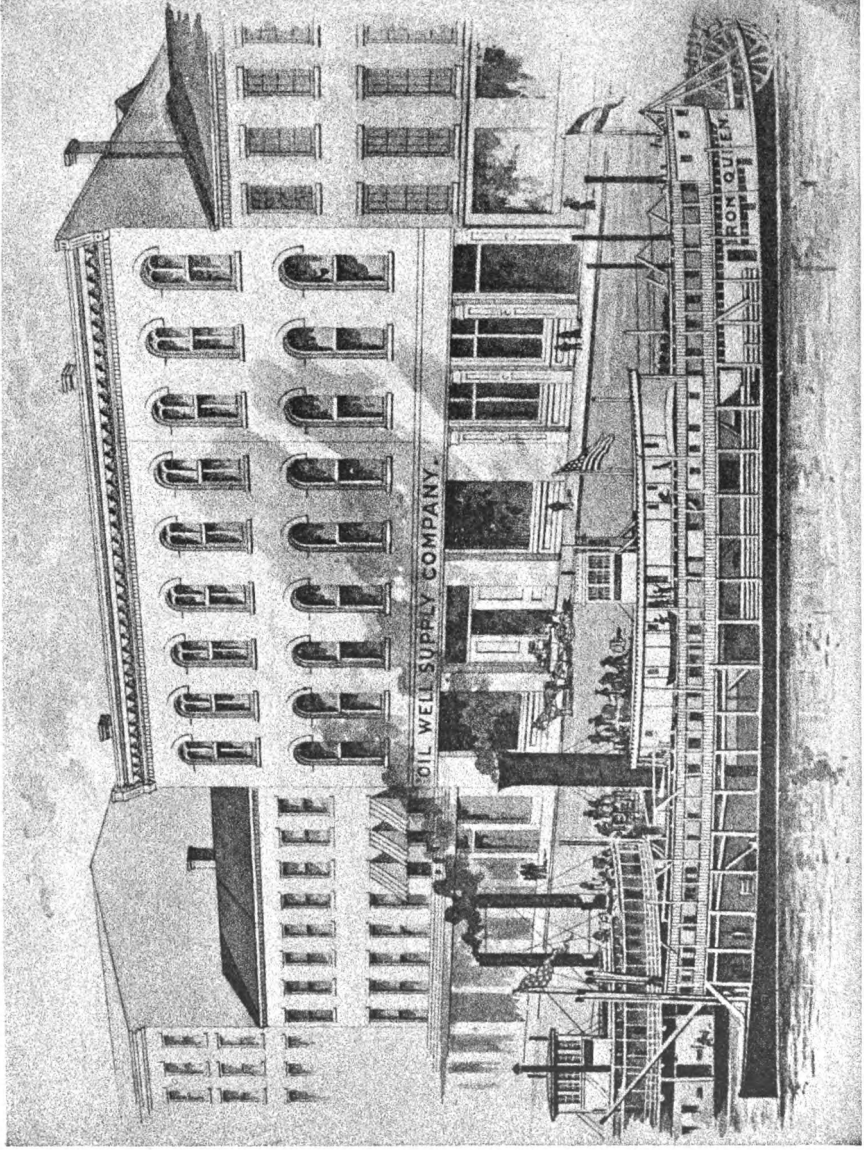
BOILER WORKS, OSWEGO, N. Y.  
Oil Country Boilers—Water Tube Boilers



MACHINE AND BLACKSMITH SHOPS, BRADFORD, PA.



RIG DEPARTMENT, PARKERSBURG, W. VA.  
Wood Work for Derricks, etc.



STORE AND MAIN OFFICES, 213-217 WATER STREET, PITTSBURGH, PA.





## NEW YORK OFFICE

Havemeyer Building, Cor. Church and Cortlandt Sts.

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## EXECUTIVE OFFICES OF THE COMPANY

213-215-217 Water Street

PITTSBURGH

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### OFFICERS

|                   |   |   |   |                |
|-------------------|---|---|---|----------------|
| John Eaton        | - | - | - | President      |
| Kenton Chickering | - | - | - | Vice-President |
| Louis Brown       | - | - | - | Treasurer      |
| Louis C. Sands    | - | - | - | Secretary      |

70 ymU  
AUBOCHAO



OFFICE OF THE  
**OIL WELL SUPPLY CO.,**  
213, 215 and 217 Water Street,  
**PITTSBURGH, PENNSYLVANIA,**  
United States of America.

THE process of obtaining water and of testing for minerals by sinking wells of small diameter has been practiced for many hundred years. In Europe it was first employed in the province of Artois, in the north of France, whence the name "Artesian" is derived.

Within the gardens of a former Dominican convent at Lillers, in Artois, there is a deep well which has flowed continuously since the year 1126, and unmistakable traces of much more ancient ones are found in various countries. Formerly it was a very difficult, tedious and expensive operation to drill a deep well, but now one can be sunk 2,000 feet at a moderate cost, and in a comparatively short time.

The modern method is an adaptation of steam power to the method practiced for ages in China. Free falling tools, suspended by a cable and worked by steam power, are used, the weight of the tools being so great as to give blows of sufficient force to pierce the hardest rock. In the Oil Regions of the United States there have been sunk many more Artesian wells than in all other parts of the world together, and great industries have been created for manufacturing the apparatus and tools to sink wells to great depths. The first well drilled for the express purpose of obtaining Oil was sunk near Titusville, in the State of Pennsylvania, by Col. E. L. Drake in 1859, since which time more than 150,000 wells have been drilled in Pennsylvania and adjoining States. There is no publication dealing with the subject or science of drilling deep wells. It is impracticable to place such work in the hands of other than experienced men. The so-called "oil country outfit" is a variable term. It is a safe assertion that two could not be found alike in all details. While the general characteristics vary but little, it is the detail which must be considered by the manufacturer, and which involves great change in selection and variation in price. It must be borne in mind that very little of this is due to fancy or other cause than that of necessity. Each outfit must be made up of parts all of which harmonize and work well together and are adapted to the particular conditions under which the outfit is to be used. From this may easily be conceived the inability of naming prices on an "ordinary outfit."

They are all ordinary to the manufacturer, but one perfectly adapted to one section of country might be almost useless in another. In attempting to assume that any particular combination might meet the requirements of a prospective customer we would depart from the proper province of the manufacturer, except in

such cases as will be referred to later on. A few general rules and observations may be given which will be of interest and value. For this purpose we will divide the material composing an outfit in the following manner:



### **RIG**

This refers only to the structure, with its foundations of heavy timbers, and the wheels and reels on which are carried the lines or cables to which are attached the drilling tools proper. We furnish all the irons, nails, bolts, and special parts for building the wheels and reels, and can, if desired, give specifications for cutting the timber and lumber, which may be obtained from local sources. The portion which we furnish will cost from \$60.00 to \$325.00, according to size and design. The weight varies from 15 cwt. to 80 cwt. In cases where timber and lumber cannot be obtained we supply the entire Rig, carefully framed, and ready to erect. Prices vary from \$600.00 to \$900.00, and average weight equivalent to two ordinary car lots, or 60,000 lbs. Shallow wells not exceeding 600 to 800 feet in depth may be drilled through ordinary formations by the use of the Corbett Mast Rig, illustrated by Fig. 1295, page 36. This Rig, while not as strong or admitting of such rapid work as the standard Rig, is particularly useful for prospecting or for conducting work where transportation facilities are limited and economy more desirable than speed.

### **MACHINERY**

By this we refer to the Boiler and Engine. The former ranges from 15 to 40 H. P., the latter from 12 to 30 H. P. Both are specially adapted to the work, and the Engine in particular is an essential. In fact, it is not practicable to use an ordinary engine for this purpose. Price, Boiler and Engine, from \$580.00 to \$900.00. Weights, 8,000 to 16,000 lbs.

### **DRILLING TOOLS**

We include under this head all essentials for making the bore and cleaning out the detritus, also all special appliances for removing tools which may be broken or otherwise fastened in the bore; also Cable and Sand Line, and tools for handling casing and pipe used in the construction of the well. This is the portion of the outfit which must be selected with the greatest care, and with an eye to its efficiency in meeting the peculiar conditions for which it is intended. It is quite impossible to give other than the widest range, and while some of the simplest and lightest outfits might be used to advantage at a cost of \$500.00, other conditions might require the expenditure of \$4,000.00 to \$5,000.00.

### **TUBULAR GOODS**

Every well requires some casing or piping in its construction. In some wells a single column of casing to shut off the water is sufficient, in others several such are needed, each column being of a size to pass through the preceding column with the

least possible lost space between the two. Frequently it is necessary to drive the columns of pipe instead of inserting them after the bore is prepared to receive them. In that case heavy pipe called drive pipe must be used. In drilling a well in a district where the geological formation is not well known it is much safer to use drive pipe. The ordinary sizes are 10, 8, 6 and 4½ inches inside diameter. No one can tell how much of each size might be required until the initial well is completed.

In the different districts of the Oil Regions the correct amounts can be quite accurately determined, as well as the sizes and kinds which can be most economically used. The foregoing observations apply to all operations conducted where the formations are composed largely of rock of varying degrees of hardness. The recent developments in Texas disclose a formation nearly devoid of rock, the formation from surface to oil-bearing stratum being a series of strata of clay and quicksand. To successfully cope with this unusual condition a quite different system is necessary, known as the

### **ROTARY HYDRAULIC OUTFIT**

This includes Boiler and Engine for power, heavy Steam Pump for the hydraulic pressure, special Hoisting Gear, Rotary Table for turning and lowering the pipe, and special appliances for connecting and operating the outfit. Such an outfit, costs, to-day, about \$3,000.00. The contractors having the most experience use **two** Boilers and **two** Pumps to provide against the danger of sticking the pipe by stopping for repairs. This would increase the cost about \$650.00.

The Rig used is a simple derrick, which can be built by any ordinary carpenter. The same rules pertaining to the regular outfit for casing and pipe will apply in the use of the **Rotary Hydraulic**.

### **COMBINATION RIG AND OUTFIT**

The Combination Rig, as its name implies, embodies the principles of both the Standard Cable Rig and the Hydraulic Rotary Rig. This involves a higher cost and greater weight. A complete outfit, not including the Tubular goods or the timber and lumber for Derrick, costs about \$5,000.00, and will weigh approximately 470 cwt.

### **PORTABLE DRILLING MACHINES**

It has been shown that great power and strength are required in performing the ordinary functions of a drilling Rig. This implies a corresponding weight, or the very antithesis of mobility.

The obvious advantages of a Rig which may be freely moved about are such that many attempts have been made to produce one of sufficient power to compete with the standard Rig. These efforts have usually resulted in disappointment. The exceptions are so rare that experienced drillers are justified in questioning any broad claims, but in presenting the "Columbia" Steel Machine every statement is based on fact and experience. As manufacturers of Machinery and Supplies for all

branches of the business we aim to produce the best in each department. The following pages give our correspondents detailed prices of goods, thus enabling them to form close calculations on costs of equipment suited to individual requirements. As it is necessary for some one with experience to conduct the work, it would be more satisfactory to both seller and purchaser for such a one to make out a list of the tools and appliances needed. When such lists are furnished we are always ready to name net prices and time required for execution of order, or we will make estimates of a suitable plant when supplied with data and the necessary information as to requirements.

### **SKILLED WORKMEN**

Require from \$125.00 to \$175.00 per month and traveling expenses both ways, their time to commence when leaving Pennsylvania and end on their return. There will be no charge for engaging such men for clients purchasing their goods from this company.

### **EXPORT**

Drilling plants have been supplied to all habitable parts of the globe, and careful records have been kept of the geological formations and physical conditions. Such records and data are of inestimable value when used in connection with the specific information which ordinarily can be given by the intending operator.

### **DISCOUNTS**

The lists given herein are in most instances subject to a discount, and discount sheets are issued at regular intervals, or as frequently as market conditions demand. Many goods, notably Tubular goods and Cordage, are subject to such frequent changes in value that prices can be given only on specification, and we cannot hold ourselves responsible for changes in price of any goods except on direct quotations, and when time limit has been specifically stated.

### **DELIVERY**

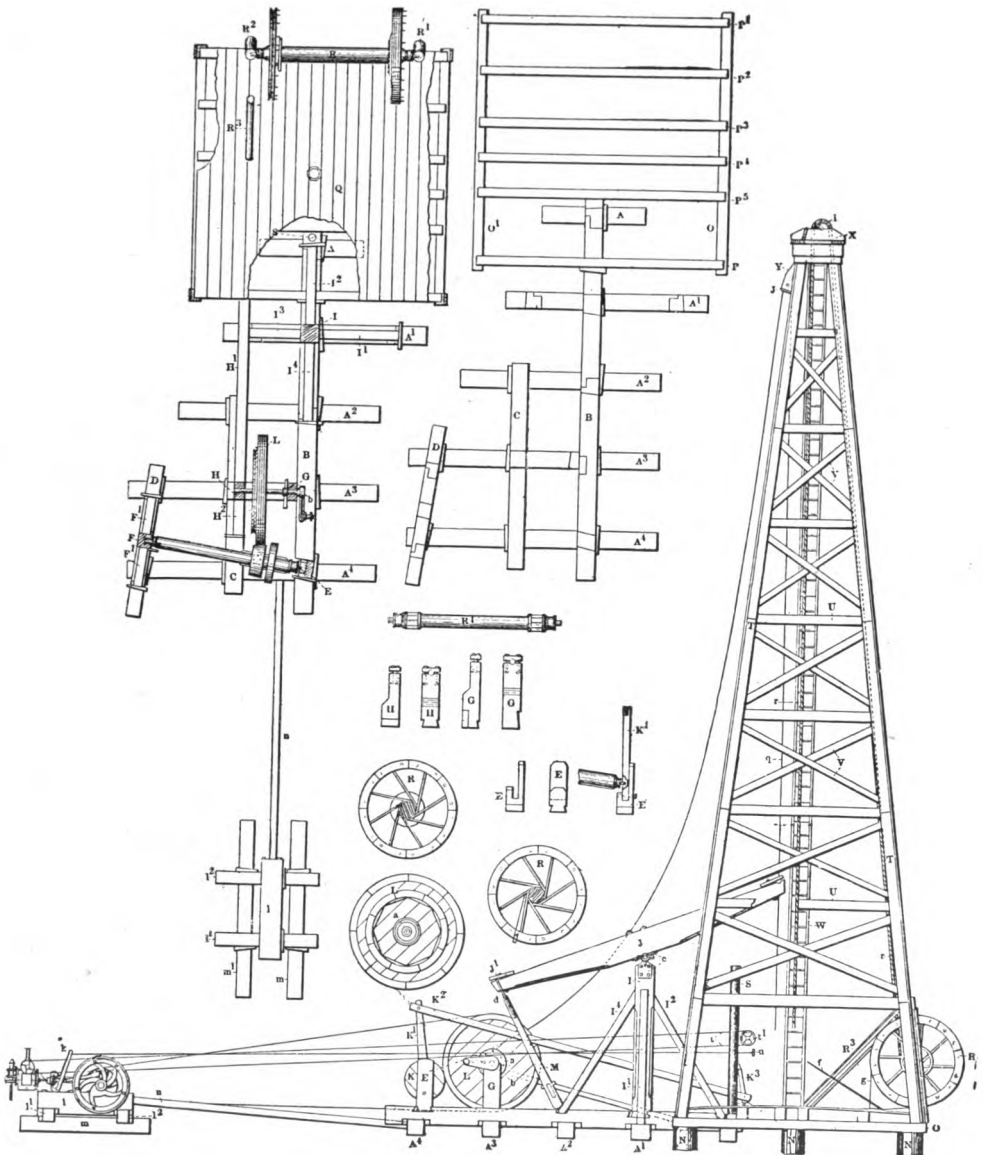
All contracts are taken subject to strikes or other causes of delay beyond our control, and our responsibility ceases upon delivery to railroad or other common carrier. Insurance will be effected, whenever desired, at customer's cost.

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| OIL BURNERS - - - - -                              | 334-336      |
| STEAM PUMPS - - - - -                              | 337-348      |

The tabulated weights are approximated and are given for convenience in calculating transportation charges.

## SIDE ELEVATION AND GROUND PLANS OF STANDARD RIG—Fig. 1200



This is the Standard "Rig" used throughout the American Oil Fields, with modifications to suit varying conditions. We can furnish our customers with full set of blue prints, drawn to scale, so that the timbers and lumber may be prepared on the ground. In such cases we supply only the special irons and parts for building the Bull, Band, and Tug Wheels; or, we can supply the entire Rig, framed and ready for erection. For illustrations, prices, and weights, see following pages.

## STANDARD RIG

## TIMBER AND LUMBER REQUIRED TO BUILD A COMPLETE RIG—DERRICK 72 FEET HIGH, BASE 20 FEET SQUARE

The sizes of timber and lumber may be exceeded, but not diminished. If necessity compels the use of smaller sizes, the deficiency in strength must be supplied by extra bracing.

The references are to Fig. 1200, page 6.

| Pieces | Size,<br>inches | Length,<br>feet | Name                                        | Illustration<br>marks | Pieces | Size,<br>inches | Length,<br>feet | Name                           | Illustration<br>marks |
|--------|-----------------|-----------------|---------------------------------------------|-----------------------|--------|-----------------|-----------------|--------------------------------|-----------------------|
| 1      | 14 x 14         | 8               | Nose sill                                   | A                     | 1      | 2 x 12          | 20              | Derrick girts, (B. W.)         | U                     |
| 4      | 16 x 14         | 16              | Mud sills                                   | 1, 2, 3, 4            | 4      | 2 x 12          | 18              | Derrick girts                  | U                     |
| 1      | 16 x 18         | 30              | Main sill                                   | B                     | 4      | 1 x 12          | 18              | Derrick girts                  | U                     |
| 1      | 16 x 18         | 16              | Sub sill                                    | C                     | 4      | 1 x 12          | 16              | Derrick girts                  | U                     |
| 1      | 12 x 12         | 12              | Sand reel tail sill                         | D                     | 4      | 1 x 12          | 14              | Derrick girts                  | U                     |
| 6      | 16 x 18         | 4               | Derrick foundation posts                    | N                     | 4      | 1 x 12          | 12              | Derrick girts                  | U                     |
| 2      | 10 x 10         | 21              | Derrick sills                               | 0, 01                 | 4      | 1 x 12          | 10              | Derrick girts                  | U                     |
| 2      | 14 x 14         | 14              | Engine mud sills                            | m-m 1                 | 4      | 1 x 12          | 8               | Derrick girts                  | U                     |
| 2      | 12 x 12         | 7               | Engine pony sills                           | 1-1, 1-2              | 4      | 1 x 12          | 5               | Derrick girts                  | U                     |
| 2      | 20 x 20         | 8               | Engine block                                | 1                     | 4      | 1 x 10          | 5               | Derrick girts                  | U                     |
| 1      | 6 x 6           | 32              | Bumper, engine block to mud sill            | n                     | 8      | 2 x 8           | 20              | Derrick braces                 | V                     |
| 6      | 8 x 10          | 20              | Derrick floor sills                         | P, P 5                | 8      | 2 x 6           | 18              | Derrick braces                 | V                     |
| 20     | 2 x 12          | 20              | Derrick floor                               | Q                     | 8      | 1 1/2 x 6       | 16              | Derrick braces                 | V                     |
| 1      | 14 x 16         | 14              | Samson post                                 | 1, 1 1/4              | 8      | 1 1/2 x 6       | 14              | Derrick braces                 | V                     |
| 2      | 6 x 8           | 14              | Samson post braces                          | 1, 2                  | 8      | 1 1/2 x 6       | 12              | Derrick braces                 | V                     |
| 1      | 6 x 8           | 16              | Samson post brace                           | 1, 3                  | 8      | 1 1/2 x 6       | 12              | Derrick braces                 | V                     |
| 1      | 6 x 8           | 12              | Samson post brace                           | ---                   | 8      | 1 x 12          | 10              | Derrick cornice                | V                     |
| 3      | 3 x 5           | 16              | Keys                                        | G, H, E               | 1      | 1 x 12          | 16              | Derrick cornice                | ---                   |
| 1      | 16 x 16         | 16              | Front and rear jack posts, and knuckle post | ---                   | 5      | 1 x 6           | 20              | Derrick cornice                | ---                   |
| 1      | 4 x 12          | 3               | Jack post caps                              | ---                   | 1      | 2 x 8           | 16              | Derrick cornice                | ---                   |
| 2      | 6 x 8           | 16              | Jack post braces                            | F                     | 1      | 2 x 6           | 18              | Reach                          | ---                   |
| 1      | 12 x 12         | 5               | Tail post                                   | R, R 2                | 2      | 1 x 6           | 14              | Reach                          | K 2                   |
| 2      | 12 x 12         | 11              | Bull wheel posts                            | K 1                   | 2      | 2 x 6           | 10              | Beam frame                     | ---                   |
| 1      | 6 x 8           | 8               | Bull wheel post brace                       | K 3                   | 1      | 1 x 12          | 6               | Beam frame                     | ---                   |
| 1      | 6 x 8           | 8               | Sand reel lever                             | J                     | 2      | 2 x 6           | 14              | Beam braces                    | ---                   |
| 1      | 12 x 26         | 6               | Sand reel handle                            | S                     | 3      | 2 x 8           | 16              | Derrick roof                   | ---                   |
| 1      | 6 x 8           | 26              | Walking beam                                | M                     | 2      | 2 x 10          | 16              | Forge roof                     | ---                   |
| 1      | 5 x 10          | 14              | Headache post                               | X                     | 2      | 2 x 6           | 16              | Sills, belt and engine houses  | ---                   |
| 1      | 4 x 12          | 12              | Pitman                                      | J, I                  | 8      | 2 x 4           | 12              | Sills, belt and engine houses  | ---                   |
| 1      | 2 x 12          | 10              | Sand sheave pulley block                    | T                     | 12     | 2 x 4           | 16              | Plates, belt and engine houses | ---                   |
| 1      | 2 x 12          | 5               | Adjuster board                              | T                     | 4      | 2 x 4           | 12              | Plates, belt and engine houses | ---                   |
| 14     | 2 x 8           | 16              | Derrick legs                                | T                     | 8      | 2 x 4           | 10              | Ladder                         | W                     |
| 16     | 2 x 8           | 16              | Derrick legs                                | T                     | 2      | 2 x 4           | 10              | Ladder                         | ---                   |
| 2      | 2 x 10          | 12              | Derrick legs                                | T                     | 28     | 1 x 12          | 16              | Boards, 3000 feet              | ---                   |
| 4      | 2 x 10          | 18              | Derrick legs, (doublers)                    | T                     | 14     | 1 x 12          | 12              | 10 foot band wheel             | ---                   |
|        |                 |                 |                                             |                       |        |                 |                 | 10 foot band wheel             | ---                   |

(Quarter moons, see page 63)

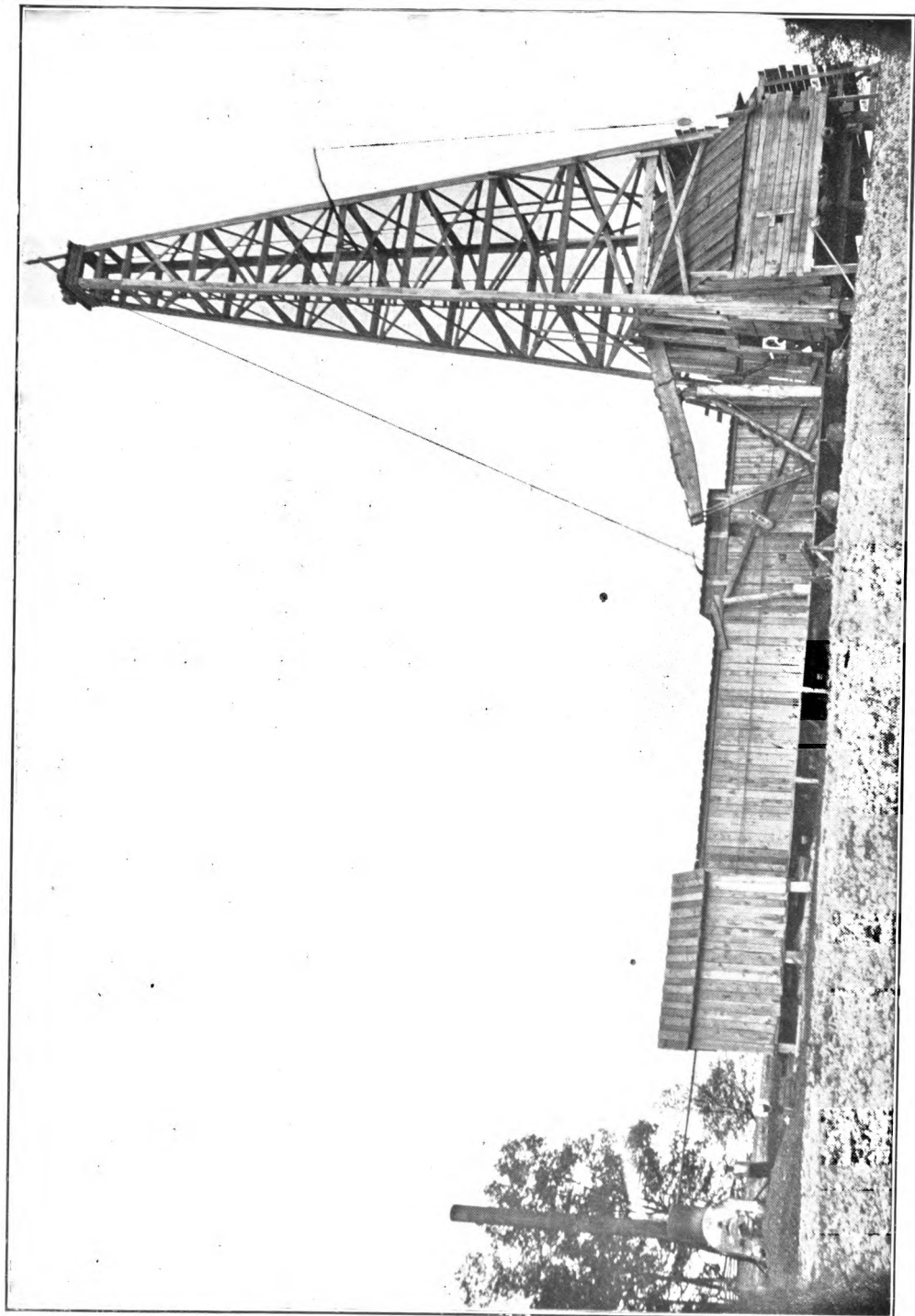
\* These pieces should be oak or other hard wood. If hard wood is not obtainable, sizes must be increased according to quality of material.

† Pitman should be 5 inches square at top, and 5 x 10 inches at bottom.

Estimated weight, 57,000 pounds.



Fig. 1202



VIEW OF STANDARD 82-FOOT RIG IN ACTUAL USE

## STANDARD RIG—HEAVY FOR DEEP WELL

### TIMBER AND LUMBER REQUIRED TO BUILD A COMPLETE RIG DERRICK 82 FEET HIGH, BASE 20 FEET SQUARE

The sizes of timber and lumber may be exceeded, but not diminished. If necessity compels the use of smaller sizes, the deficiency in strength must be supplied by extra bracing.

The references are to Fig. 1200, page 6.

| Pieces | Size,<br>inches | Length,<br>feet | Name                                                  | Illustration<br>marks |
|--------|-----------------|-----------------|-------------------------------------------------------|-----------------------|
| 1      | 16 x 16         | 10              | Nose sill - - - - -                                   | A                     |
| 2      | 16 x 18         | 16              | Mud sills - - - - -                                   | A 1, A 2              |
| 2      | 16 x 18         | 20              | Mud sills - - - - -                                   | A 3, A 4              |
| § 1    | 18 x 18         | 31              | Main sill - - - - -                                   | B                     |
| 1      | 18 x 18         | 16              | Sub sill - - - - -                                    | C                     |
| 1      | 14 x 14         | 16              | Sand reel tail sill - - - - -                         | D                     |
| 6      | 16 x 18         | 4               | Derrick foundation posts - - - - -                    | N                     |
| 2      | 10 x 10         | 21              | Derrick sills - - - - -                               | 0, O 1                |
| 2      | 16 x 18         | 14              | Engine mud sills - - - - -                            | m-m 1                 |
| 2      | 16 x 16         | 12              | Engine pony sills - - - - -                           | 1-1, 1 2              |
| 1      | 20 x 24         | 9               | Engine block - - - - -                                | 1                     |
| 2      | 8 x 10          | 25              | Bumpers, engine block to mud sill - - - - -           | n                     |
| 6      | 10 x 10         | 21              | Derrick floor sills - - - - -                         | P to P 5              |
| 20     | 2 x 12          | 20              | Derrick floor - - - - -                               | O                     |
| 1      | 16 x 16         | 16              | Samson post - - - - -                                 | I                     |
| 2      | 6 x 8           | 14              | Samson post braces - - - - -                          | 1-1, 1-4              |
| 1      | 6 x 8           | 16              | Samson post brace - - - - -                           | 1-2                   |
| 1      | 6 x 8           | 12              | Samson post brace - - - - -                           | 1-3                   |
| * 3    | 3 x 5           | 16              | Keys - - - - -                                        | - - -                 |
| * 1    | 16 x 18         | 16              | Front and rear jack posts, and knuckle post - - - - - | G, H E                |
| * 1    | 4 x 12          | 5               | Jack post caps - - - - -                              | - - -                 |
| 2      | 6 x 8           | 16              | Jack post braces - - - - -                            | - - -                 |
| * 1    | 12 x 14         | 5               | Tail post - - - - -                                   | F                     |
| * 1    | 14 x 14         | 22              | Bull wheel posts - - - - -                            | R 1, R 2              |
| 1      | 6 x 8           | 14              | Bull wheel post brace - - - - -                       | R 3                   |
| * 1    | 6 x 10          | 14              | Sand reel lever and dead block - - - - -              | K 1                   |
| * 1    | 2 x 6           | 6               | Sand reel handle - - - - -                            | K 3                   |
| † 1    | 14 x 26         | 26              | Walking beam - - - - -                                | J                     |
| * 1    | 6 x 8           | 14              | Headache post - - - - -                               | S                     |
| * 1    | 5 x 12          | 12              | Pitman † - - - - -                                    | M                     |
| * 1    | 5 x 14          | 16              | Crown block - - - - -                                 | X                     |
| * 1    | 3 x 14          | 10              | Sand sheave pulley block - - - - -                    | Y                     |
| * 1    | 2 x 14          | 5               | Adjuster board - - - - -                              | J 1                   |
| 65     | 2 x 8           | 16              | Derrick legs, corners, and doublers - - - - -         | T                     |
| 24     | 2 x 10          | 16              | Derrick corners, crown, and water table - - - - -     | - - -                 |
| 4      | 2 x 10          | 18              | Starting legs - - - - -                               | - - -                 |
| 1      | 18 x 18         | 14              | Bull wheel shaft - - - - -                            | R                     |
| 65     | 1½ x 12         | 16              | Derrick girts and band wheel - - - - -                | - - -                 |
| 10     | 2 x 12          | 18              | Derrick bottom girts - - - - -                        | - - -                 |
| 18     | 2 x 6           | 18              | Derrick bottom braces - - - - -                       | - - -                 |
| 80     | 1 x 6           | 16              | Derrick braces and roof batting - - - - -             | - - -                 |
| 17     | 2 x 4           | 16              | Ladder and arms for sand reel - - - - -               | - - -                 |
| 3      | 2 x 6           | 16              | Sand reel reach and handle - - - - -                  | - - -                 |
| 5      | 2 x 4           | 12              | Top frame for engine house - - - - -                  | - - -                 |
| 4      | 2 x 6           | 12              | Bottom frame for engine house - - - - -               | - - -                 |
| 5      | 2 x 12          | 20              | Plank (extra) - - - - -                               | - - -                 |
| --     | 1               | 18              | Boards, 500 feet - - - - -                            | - - -                 |
| --     | 1               | 16              | Boards, 2000 feet - - - - -                           | - - -                 |
| --     | 1               | 10              | Boards (belt house siding), 500 feet - - - - -        | - - -                 |
| --     | 1               | 9               | Boards (extra), 500 feet - - - - -                    | - - -                 |
| 4      | 2 x 8           | 20              | Plank (extra) - - - - -                               | - - -                 |

If closed or winter rig is desired, add 500 feet, 1 inch by 18 foot boards.

\* These pieces should be oak or other hard wood. If hard wood is not obtainable, sizes must be increased according to quality of material.

§ The main sill may be sawed in two pieces, 16 and 18 feet in length, with 2-foot splice.

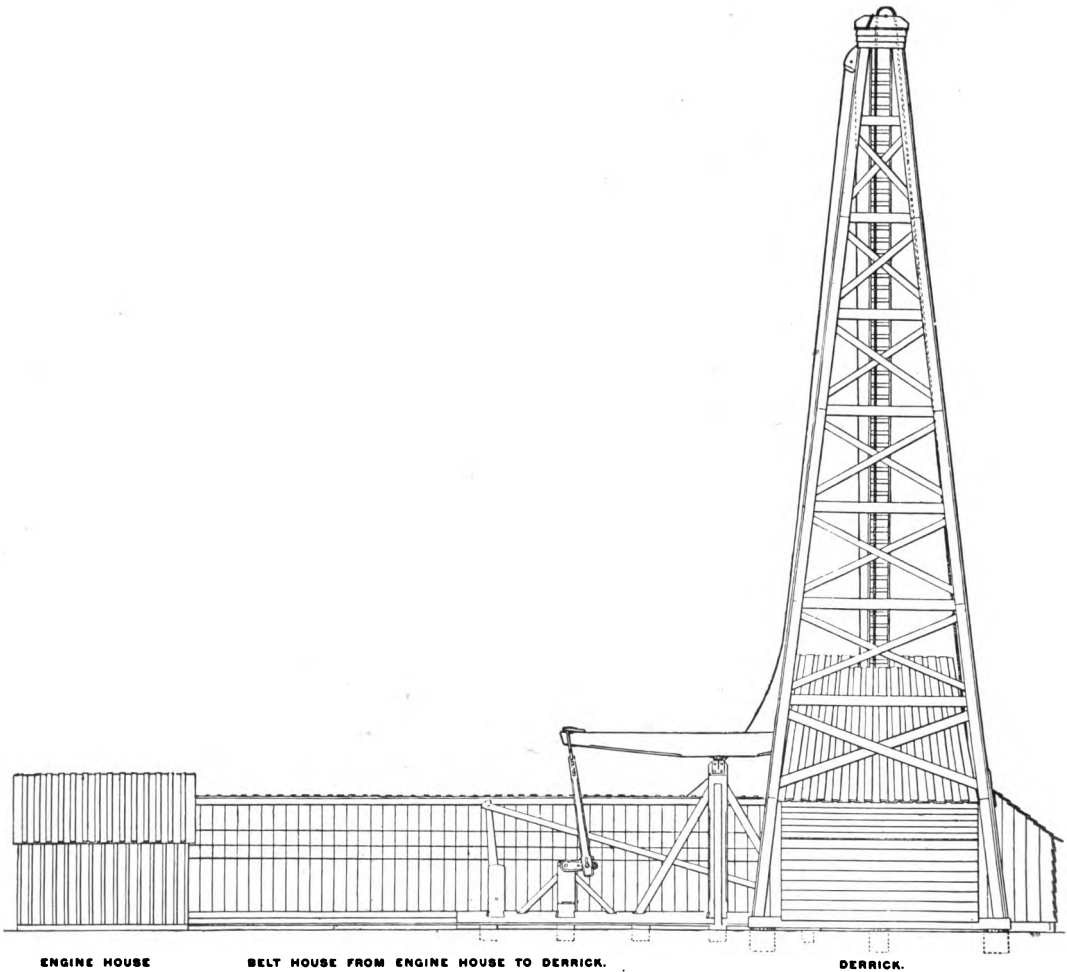
† Pitman should be 5 inches square at top, and 5 x 12 inches at bottom.

‡ The walking beam should be 14 inches square at each end, the taper beginning 3 feet on each side from center.

Estimated weight, 67,000 pounds.

CLOSED RIG

Fig. 1201



The lower part of the derrick is enclosed to protect the machinery and workmen from cold or stormy weather

DERRICK STAYS

ANDERSON'S PATENT

A set consists of 4 levers, 4 loops, 4 stakes, 4 rings, and 40 lbs. of No. 6 iron wire. Per set, \$5 00

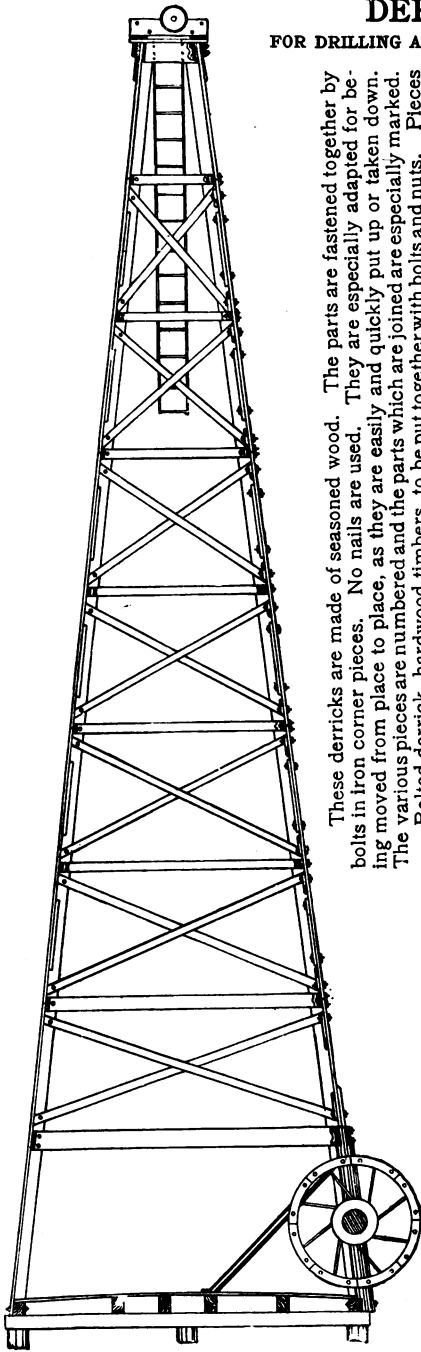
If stakes are not wanted, deduct 40 cents.

4 loops, 4 levers, and 4 rings - - - - - 2 00

Fig. 1222

## COMPLETE BOLTED DERRICK

FOR DRILLING AND PUMPING WELLS

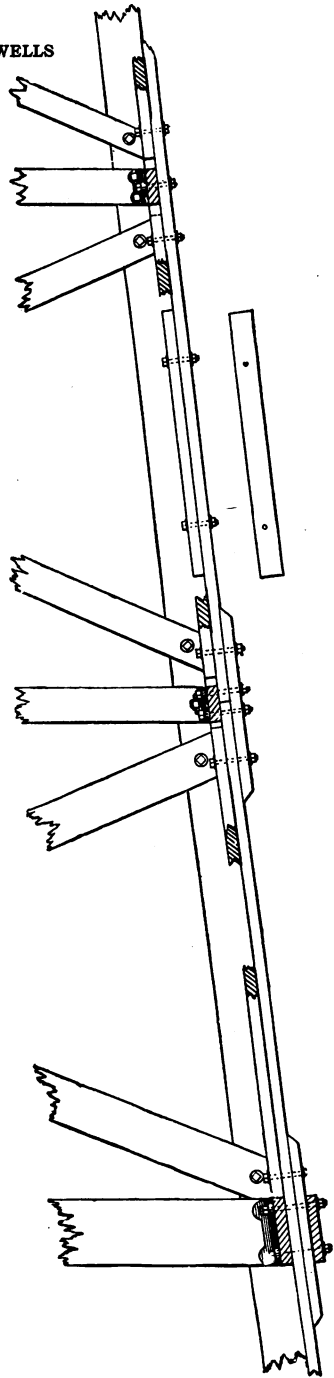


72 feet high

These derricks are made of seasoned wood. The parts are fastened together by bolts in iron corner pieces. No nails are used. They are especially adapted for being moved from place to place, as they are easily and quickly put up or taken down. The various pieces are numbered and the parts which are joined are especially marked.

Bolted derrick, hardwood timbers, to be put together with bolts and nuts. Pieces framed and numbered ready to be put up. This includes bull and band wheel, sand pump reel, 3½-inch rig iron, nails, brake, band, lever, staple and back brake. Everything complete, ready to put up. 72 feet high - - - - - price, \$850 00  
The same, with 4-inch irons and 82 feet high - - - - - 900 00  
Fig. 1222, derrick only, made of pine lumber, 72 feet high - - - - - 300 00

Fig. 1223

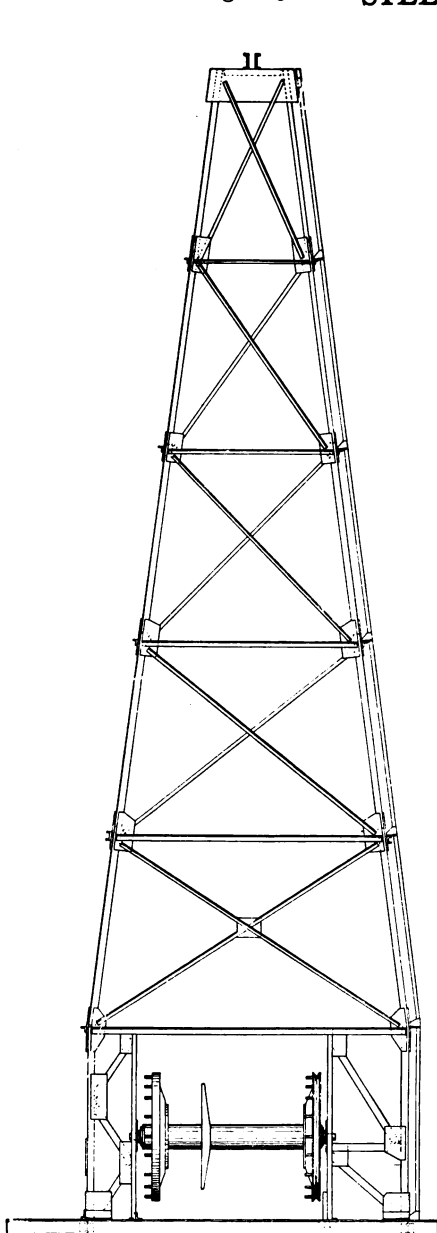


Corner of derrick

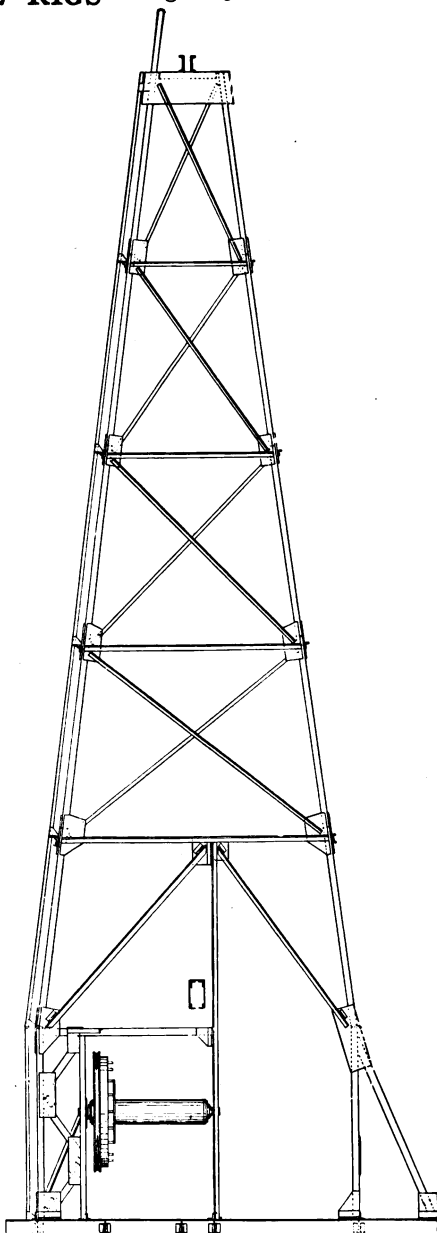
Fig. 1231

## STEEL RIGS

Fig. 1232

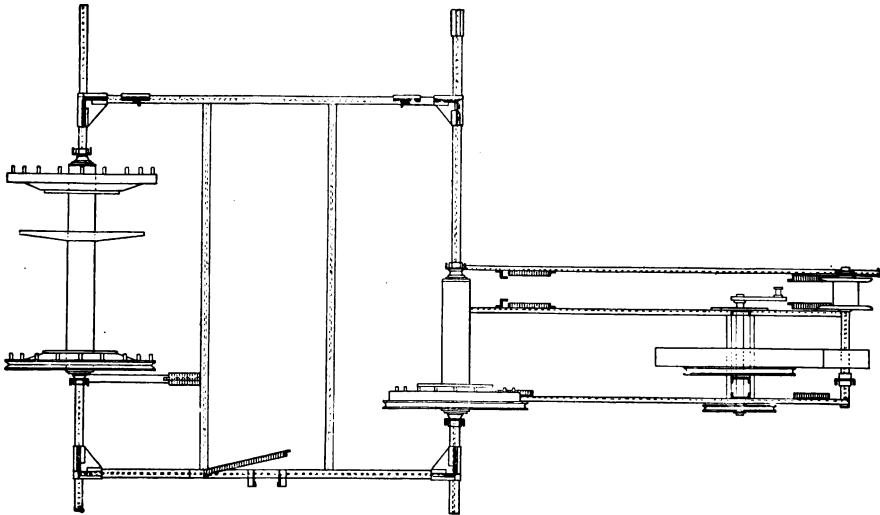


Elevation showing front side of Derrick with Bull Wheels, and construction of Bull Wheel hangers and bracing.

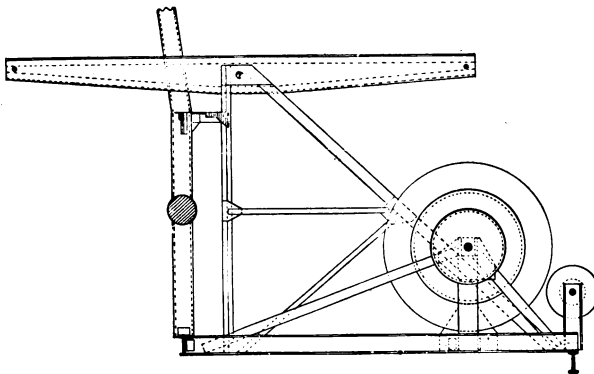


Elevation showing rear side of Derrick with Calf Wheel, and construction of Calf Wheel hangers and bracing.

Full prints showing detail of Ladder side and Forge House side of derrick are supplied to all purchasers.

**STEEL RIGS****Ground Plan, Fig. 1233**

Showing Base, Bull Wheels and Calf Wheel with hangers, Band Wheel, Tug Pulley, Outer Tug Pulley for Calf Wheel and Sand Reel.

**Elevation, Fig. 1234**

Showing Walking Beam, Samson Post and braces, Jack Post and braces, Band Wheel, Tug Pulley, Outer Tug Pulley for Calf Wheel, section of Calf Wheel Shaft and Sand Reel.

## STEEL RIGS

Our Steel Rigs were designed by competent engineers who are acquainted with the actual requirements.

These Rigs are easily erected and are practically indestructible.

The question of obtaining sound timber of suitable size for rigs is fast becoming a serious one, and at no distant day the price will be prohibitive.

The steel rig is lighter than the wooden rig and the cost of transportation is correspondingly less.

In order to meet varying requirements, the steel rig has been designed so that it may be supplied in part or as a whole. We can furnish the derrick only which can be supported on any foundation to suit purchaser, or the derrick with steel foundation; or the derrick with foundation and main sill with steel samson post and walking beam and steel sand reel. In all cases the bull wheels and band wheel will be built up of wood. Then when required the California style Calf Wheels may be added as the rig is arranged for hanging them. A steel frame is also furnished for supporting roof to derrick and covering to band wheel and belt.

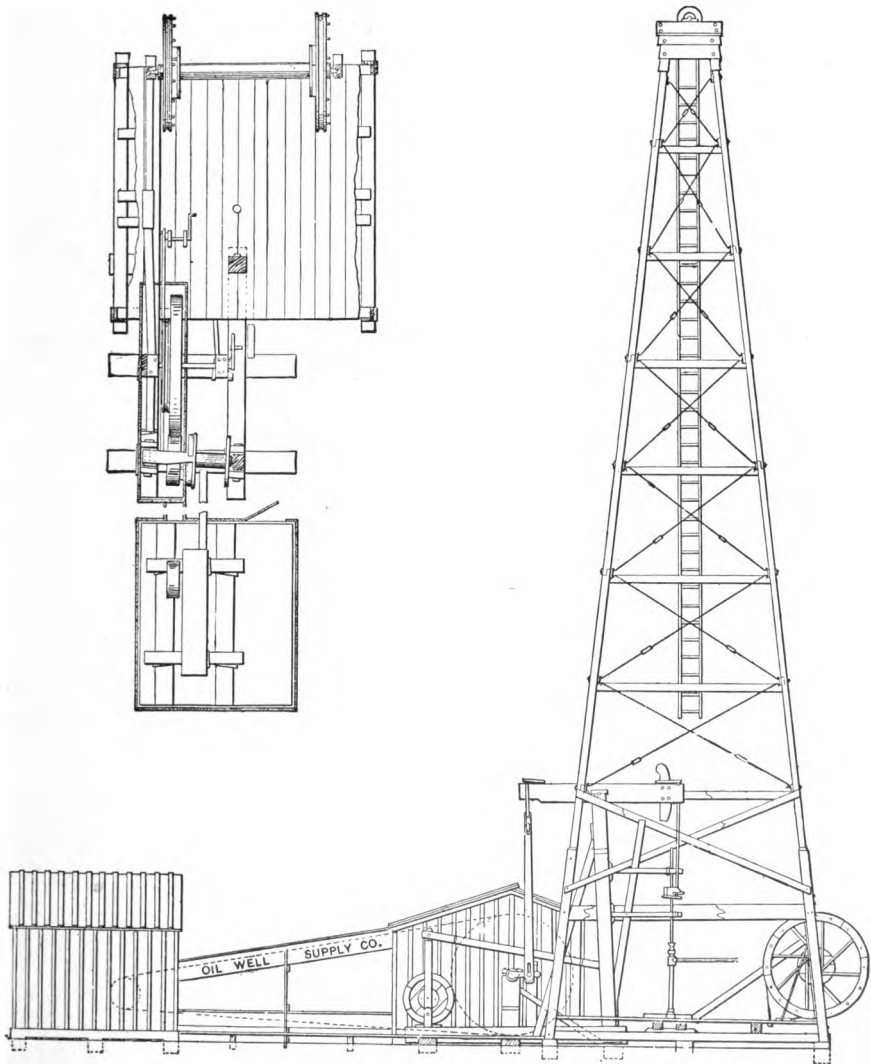
The various divisions and weights are scheduled as follows:

|                                                                   | Weight, lbs. |
|-------------------------------------------------------------------|--------------|
| Derrick without base - - - - -                                    | 16,000       |
| Base - - - - -                                                    | 4,700        |
| Walking Beam, Jack Post, Samson Post, Knuckle Post, etc - - - - - | 7,500        |
| Framing of house - - - - -                                        | 2,800        |
| Ladder - - - - -                                                  | 750          |
| 30 Squares Corrugated Iron - - - - -                              | 2,910        |
| 1 set Band Wheel Cants (complete) } - - - - -                     | 746          |
| 1 set Bull Wheel Cants (complete) } - - - - -                     |              |
| Shaft, Crank, Wrist Pin and Flanges - - - - -                     | 552          |
| 1 California Iron Sand Reel - - - - -                             | 1,372        |
| 1 24-inch Sand Line Pulley - - - - -                              | 90           |
| 1 30-inch Crown Pulley - - - - -                                  | 280          |
| 1 Oak Bull Wheel Shaft - - - - -                                  | 1,144        |
| 1 Engine Block - - - - -                                          | 800          |
| Calf Wheel Adjunct - - - - -                                      | 2,864        |
| Total Weight - - - - -                                            | 42,508       |

Derrick 72 feet high; 20 foot Base.

**SIDE ELEVATION AND GROUND PLAN OF RIG**

With straight line sand reel and short segment walking beam, chain and clevis, arranged for pumping; two mud sills; turnbuckle braces, legs of derrick of square timbers.

**Fig. 1240**



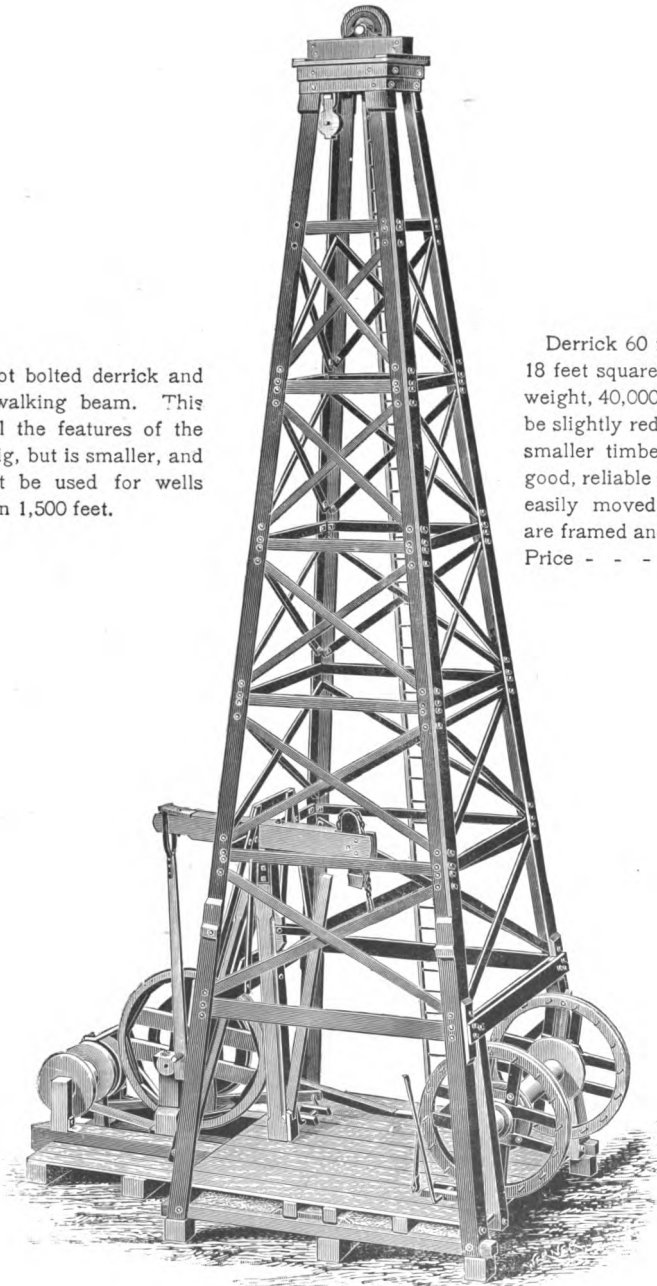
## A COMPACT, STRONG, AND DURABLE RIG

Fig. 1243

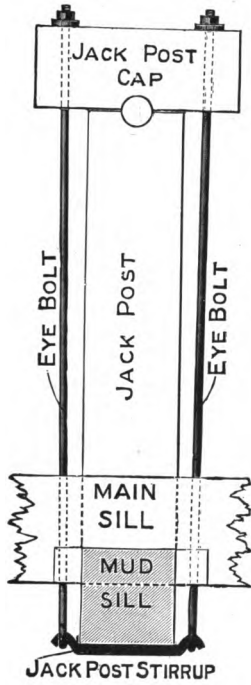
Sixty-foot bolted derrick and segment walking beam. This rig has all the features of the standard rig, but is smaller, and should not be used for wells deeper than 1,500 feet.

Derrick 60 feet high, base 18 feet square; approximate weight, 40,000 pounds. Can be slightly reduced by using smaller timbers. This is a good, reliable rig, and can be easily moved, as all parts are framed and bolted.

Price - - - - \$600 00

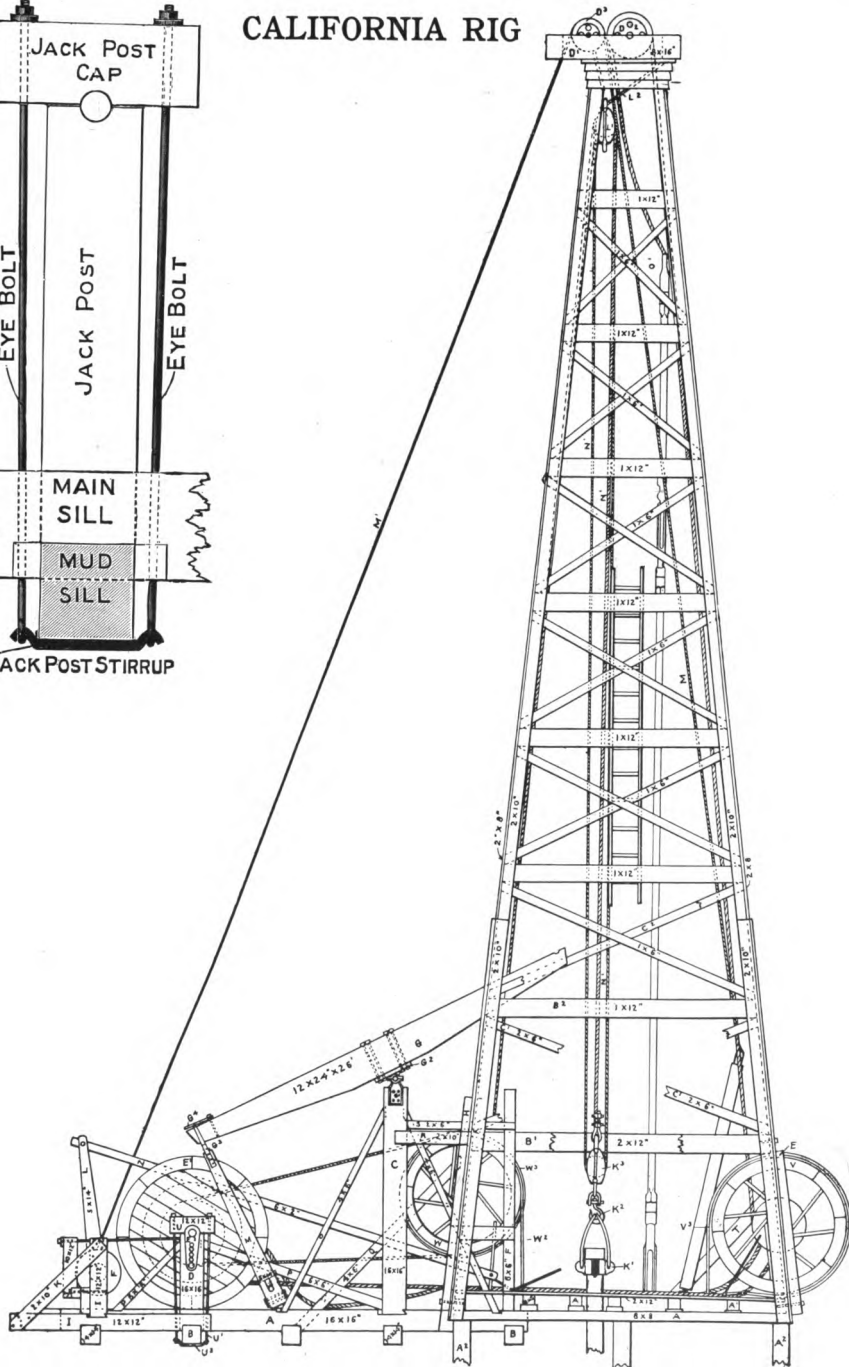


**Fig. 1207A**



**Fig. 1207**

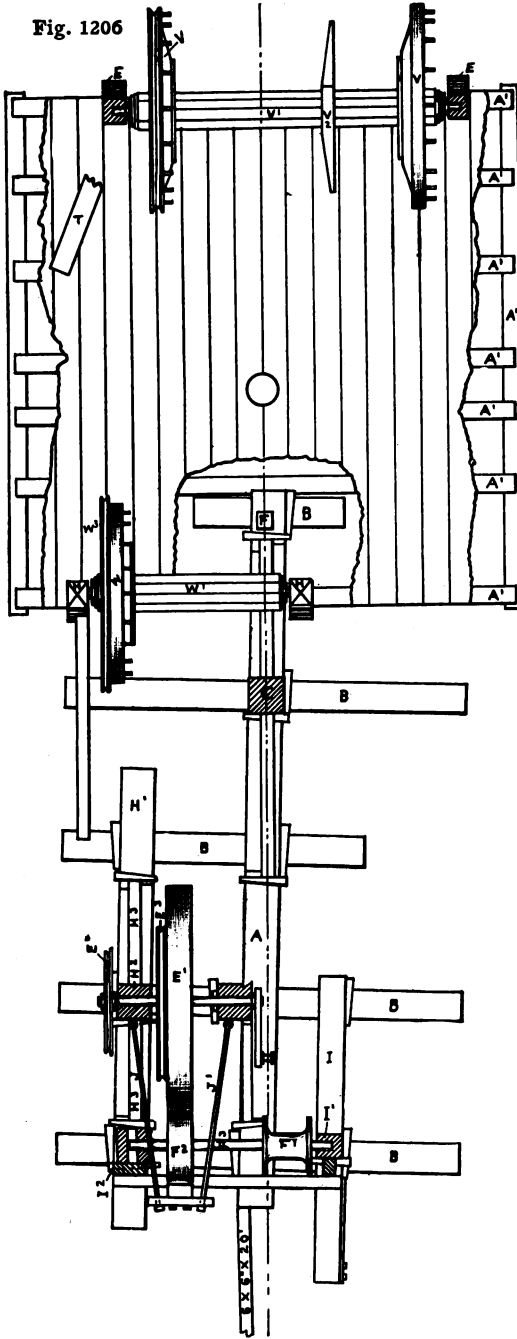
## CALIFORNIA RIG



Side elevation

# PLAN OF CALIFORNIA RIG, SHOWING CALF WHEEL

Fig. 1206



The California Rig, as its name implies, first came into general use in California, where the peculiar nature of the strata required a secondary reel for handling the casing. This secondary reel, or Calf Wheel, as it is called, is operated by a tug rope passing over a cast-iron rim attached to the built-up side of the wheel and passing over a grooved wheel keyed on to the outer end of the main rig iron shaft. A steel sand reel is always used with this rig.

For prices of special reels and irons, see pages 65, 66 and 67.

## CALIFORNIA RIG

## SPECIFICATION OF TIMBER AND LUMBER

| No.<br>Pieces                  | Dimensions                        | FOR                                                                                | No.<br>Feet |
|--------------------------------|-----------------------------------|------------------------------------------------------------------------------------|-------------|
| 1                              | 16 in. x 16 in. x 22 ft.          | Bull wheel shaft (13 ft.), calf wheel shaft (9 ft.)                                | 469         |
| 1                              | 16 in. x 16 in. x 28 ft.          | Main sill - - - - -                                                                | 597         |
| 2                              | 16 in. x 16 in. x 14 ft.          | Samson post, jack and knuckle posts - - - - -                                      | 598         |
| 1                              | 16 in. x 16 in. x 18 ft.          | Sub sill - - - - -                                                                 | 384         |
| 4                              | 14 in. x 14 in. x 16 ft.          | Mud sills - - - - -                                                                | 1,045       |
| 1                              | 24 in. x 24 in. x 8 ft.           | Engine block - - - - -                                                             | 384         |
| 1                              | 12 in. x 12 in. x 24 ft.          | Tail sill and post, back brake and cap - - - - -                                   | 288         |
| 1                              | 12 in. x 12 in. x 16 ft.          | Engine pony sills - - - - -                                                        | 192         |
| 2                              | 12 in. x 12 in. x 12 ft.          | Engine mud sills - - - - -                                                         | 288         |
| 1                              | 12 in. x 12 in. x 24 in. x 26 ft. | Walking beam - - - - -                                                             | 624         |
| 2                              | 10 in. x 12 in. x 24 ft.          | Bull wheel and calf wheel posts - - - - -                                          | 480         |
| 1                              | 10 in. x 10 in. x 12 ft.          | Boiler hanger - - - - -                                                            | 100         |
| 1                              | 8 in. x 8 in. x 12 ft.            | Top cap or plate - - - - -                                                         | 64          |
| 1                              | 8 in. x 8 in. x 14 ft.            | Crane post - - - - -                                                               | 75          |
| 10                             | 8 in. x 8 in. x 20 ft.            | Mud sills, floor joists, and posts - - - - -                                       | 1,068       |
| 1                              | 6 in. x 6 in. x 2 ft.             | Oak, pitman (sand reel lever) - - - - -                                            | 6           |
| 3                              | 6 in. x 6 in. x 14 ft.            | Headache post, back brake, jack post braces - - - - -                              | 126         |
| 1                              | 6 in. x 6 in. x 20 ft.            | Bunting post - - - - -                                                             | 60          |
| 2                              | 5 in. x 5 in. x 12 in. x 12 ft.   | Pitman and sand reel swing lever - - - - -                                         | 50          |
| 1                              | 4 in. x 10 in. x 14 ft.           | Boiler hanger - - - - -                                                            | 47          |
| 2                              | 4 in. x 6 in. x 14 ft.            | Roof rafters (derrick) - - - - -                                                   | 56          |
| 9                              | 4 in. x 6 in. x 16 ft.            | Braces and keys - - - - -                                                          | 288         |
| 2                              | 2 in. x 16 in. x 16 ft.           | Crown block - - - - -                                                              | 85          |
| 3                              | 2 in. x 16 in. x 12 ft.           | Crown block - - - - -                                                              | 96          |
| 45                             | 2 in. x 12 in. x 20 ft.           | Walk, first girts and floor, forge house floor - - - - -                           | 1,800       |
| 4                              | 2 in. x 10 in. x 24 ft.           | Derrick leg doublers - - - - -                                                     | 160         |
| 2                              | 2 in. x 10 in. x 20 ft.           | Samson post side braces - - - - -                                                  | 67          |
| 4                              | 2 in. x 10 in. x 18 ft.           | Derrick long starting legs - - - - -                                               | 120         |
| 14                             | 2 in. x 10 in. x 16 ft.           | Derrick long legs - - - - -                                                        | 373         |
| 4                              | 2 in. x 8 in. x 20 ft.            | Derrick short starting legs - - - - -                                              | 107         |
| 19                             | 2 in. x 8 in. x 16 ft.            | Derrick legs, water table, and gin pole - - - - -                                  | 405         |
| 10                             | 2 in. x 6 in. x 20 ft.            | First braces, forge house floor joists - - - - -                                   | 200         |
| 1                              | 2 in. x 6 in. x 16 ft.            | Bull wheel spool arms - - - - -                                                    | 16          |
| 10                             | 2 in. x 4 in. x 20 ft.            | Housing for bull wheel, engine, and rig - - - - -                                  | 134         |
| 4                              | 2 in. x 4 in. x 12 ft.            | Housing for bull wheel, engine, and rig - - - - -                                  | 32          |
| 6                              | 2 in. x 4 in. x 18 ft.            | Forge house joists and rafters - - - - -                                           | 72          |
| 4                              | 2 in. x 4 in. x 16 ft.            | Derrick roof frame - - - - -                                                       | 43          |
| 8                              | 2 in. x 3 in. x 16 ft.            | Derrick ladder - - - - -                                                           | 64          |
| 152                            | 1 in. x 12 in. x 20 ft.           | Girts, crown, forge house sides, housing for bull wheel and engine house - - - - - | 3,040       |
| 100                            | 1 in. x 12 in. x 16 ft.           | Derrick roof and housing for bull wheel and engine house - - - - -                 | 1,600       |
| 10                             | 1 in. x 12 in. x 14 ft.           | Boiler siding - - - - -                                                            | 140         |
| 50                             | 1 in. x 6 in. x 18 ft.            | Derrick braces - - - - -                                                           | 450         |
| Total number of feet - - - - - |                                   |                                                                                    | 16,293      |

Estimated shipping weight, 55,000 pounds.

## HYDRAULIC ROTARY RIG

(Not illustrated)

This rig is a plain derrick without any of the adjuncts of bull wheels, band or tug wheels. The engine is set close to the derrick and drives the hoisting gear and the rotary table by means of a chain transmission passing over sprocket gear wheels.

The derrick may be 20 feet base and 57 feet high, or 22 feet base and 72 feet high.

### SPECIFICATIONS OF LUMBER FOR ROTARY DERRICK

| FOR DERRICK 72 FEET HIGH      |                      |                  |  |
|-------------------------------|----------------------|------------------|--|
| 4 pieces                      | 10 x 10 in. x 22 ft. | for sills        |  |
| 10 pieces                     | 2 x 12 in. x 22 ft.  | for floor joists |  |
| 35 pieces                     | 2 x 8 in. x 22 ft.   | for floor        |  |
| 4 pieces                      | 2 x 12 in. x 40 ft.  | for legs         |  |
| 4 pieces                      | 2 x 12 in. x 34 ft.  |                  |  |
| 4 pieces                      | 2 x 10 in. x 40 ft.  |                  |  |
| 4 pieces                      | 2 x 10 in. x 34 ft.  |                  |  |
| 4 pieces                      | 2 x 12 in. x 20 ft.  |                  |  |
| 4 pieces                      | 2 x 12 in. x 18 ft.  | for girts        |  |
| 4 pieces                      | 2 x 12 in. x 16 ft.  |                  |  |
| 4 pieces                      | 2 x 12 in. x 14 ft.  |                  |  |
| 4 pieces                      | 2 x 12 in. x 12 ft.  |                  |  |
| 4 pieces                      | 1 x 12 in. x 10 ft.  |                  |  |
| 2 pieces                      | 1 x 12 in. x 16 ft.  | for braces       |  |
| 2 pieces                      | 1 x 12 in. x 12 ft.  |                  |  |
| 1 piece                       | 1 x 12 in. x 16 ft.  |                  |  |
| 8 pieces                      | 1 x 6 in. x 20 ft.   |                  |  |
| 8 pieces                      | 1 x 6 in. x 18 ft.   |                  |  |
| 8 pieces                      | 1 x 6 in. x 16 ft.   |                  |  |
| 8 pieces                      | 1 x 6 in. x 14 ft.   |                  |  |
| 8 pieces                      | 1 x 6 in. x 12 ft.   |                  |  |
| 4 pieces                      | 1 x 6 in. x 18 ft.   |                  |  |
| 4 pieces                      | 1 x 6 in. x 14 ft.   |                  |  |
| 1 piece                       | 2 x 12 in. x 12 ft.  | for pulley       |  |
| 2 pieces                      | 4 x 4 in. x 10 ft.   | blocks           |  |
| 144 lineal feet               | 2 in. x 4 in.        | for ladder       |  |
| 144 lineal feet               | 1 in. x 4 in.        |                  |  |
| Total, 4,625 feet.            |                      | 100 lbs. nails.  |  |
| Estimated weight, 18,000 lbs. |                      |                  |  |

| FOR DERRICK 57 FEET HIGH      |                      |                  |  |
|-------------------------------|----------------------|------------------|--|
| 4 pieces                      | 10 x 10 in. x 20 ft. | for sills        |  |
| 8 pieces                      | 2 x 12 in. x 20 ft.  | for floor joists |  |
| 32 pieces                     | 2 x 8 in. x 20 ft.   | for floor        |  |
| 4 pieces                      | 2 x 12 in. x 32 ft.  | for legs         |  |
| 4 pieces                      | 2 x 12 in. x 28 ft.  |                  |  |
| 4 pieces                      | 2 x 10 in. x 32 ft.  |                  |  |
| 4 pieces                      | 2 x 10 in. x 28 ft.  |                  |  |
| 4 pieces                      | 2 x 12 in. x 18 ft.  |                  |  |
| 4 pieces                      | 2 x 12 in. x 16 ft.  | for girts        |  |
| 4 pieces                      | 2 x 12 in. x 14 ft.  |                  |  |
| 4 pieces                      | 2 x 12 in. x 12 ft.  |                  |  |
| 4 pieces                      | 1 x 12 in. x 12 ft.  |                  |  |
| 2 pieces                      | 1 x 12 in. x 18 ft.  |                  |  |
| 2 pieces                      | 1 x 12 in. x 14 ft.  | for braces       |  |
| 2 pieces                      | 1 x 12 in. x 10 ft.  |                  |  |
| 1 piece                       | 1 x 12 in. x 16 ft.  |                  |  |
| 8 pieces                      | 1 x 6 in. x 18 ft.   |                  |  |
| 8 pieces                      | 1 x 6 in. x 16 ft.   |                  |  |
| 8 pieces                      | 1 x 6 in. x 14 ft.   |                  |  |
| 8 pieces                      | 1 x 6 in. x 12 ft.   |                  |  |
| 8 pieces                      | 1 x 6 in. x 10 ft.   |                  |  |
| 4 pieces                      | 1 x 6 in. x 16 ft.   |                  |  |
| 4 pieces                      | 1 x 6 in. x 12 ft.   |                  |  |
| 1 piece                       | 2 x 12 in. x 12 ft.  | for pulley       |  |
| 2 pieces                      | 4 x 4 in. x 10 ft.   | blocks           |  |
| 114 lineal feet               | 2 in. x 4 in.        | for ladder       |  |
| 114 lineal feet               | 1 in. x 4 in.        |                  |  |
| Total, 3,892 feet.            |                      | 95 lbs. nails.   |  |
| Estimated weight, 15,000 lbs. |                      |                  |  |



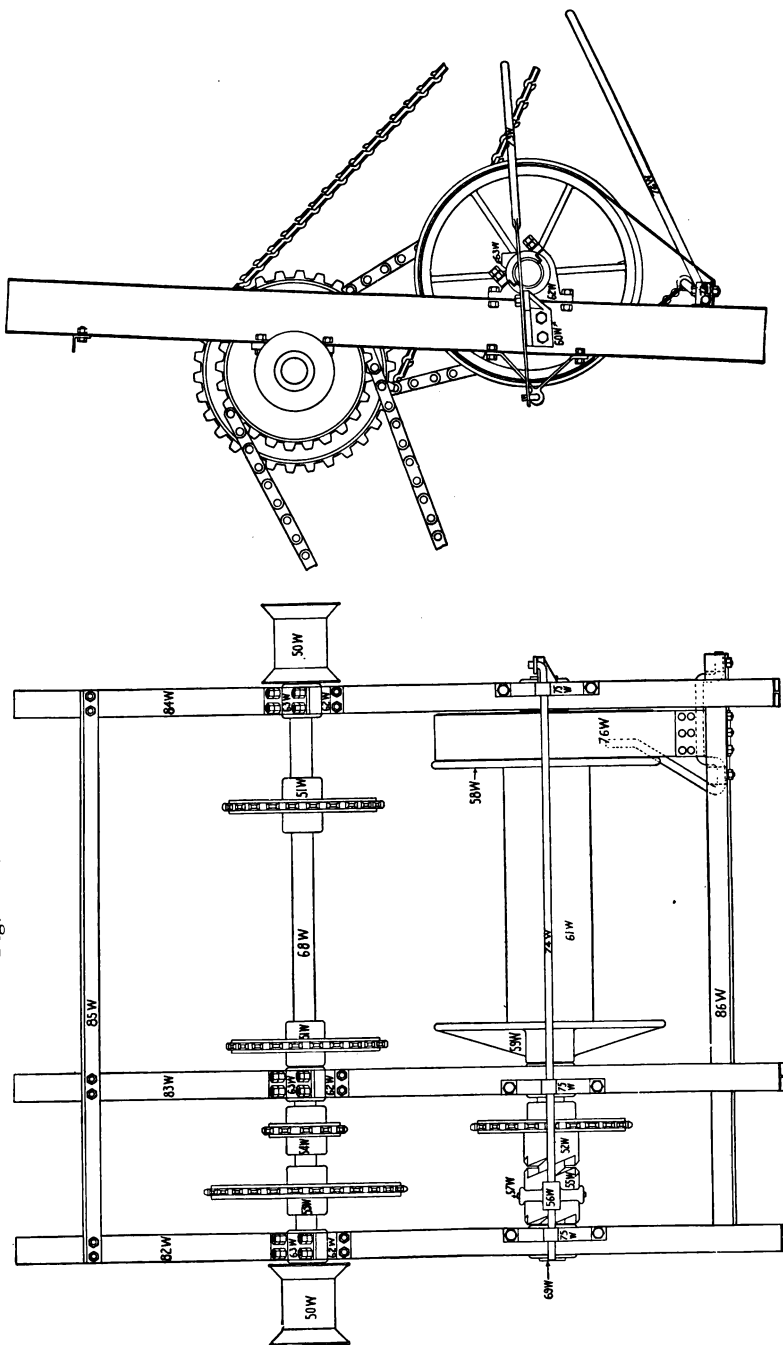


Fig. 2212.

**O. W. S. Rotary Hoist**  
Built of steel and iron. Strong and easily handled.

**Built of steel and iron. Strong and easily handled.**

**Weight 2,000 lbs.**

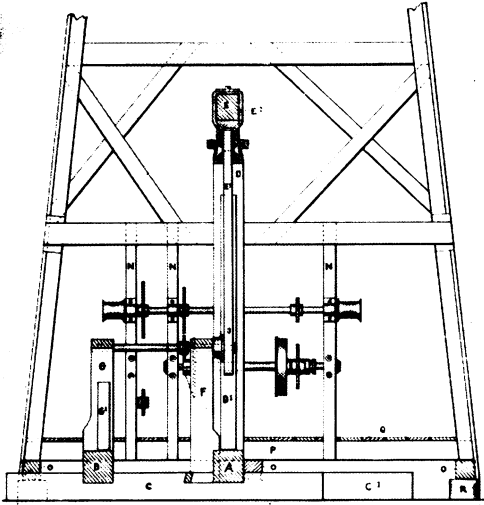
|               |           |                   |
|---------------|-----------|-------------------|
| <b>Price</b>  | - - - - - | <b>\$250.00</b>   |
| <b>Weight</b> | - - - - - | <b>7,000 lbs.</b> |

**COMBINATION RIG**

(Patented)

**FOR CABLE TOOLS AND HYDRAULIC ROTARY**

Equally effective with either system

**Fig. 1271**

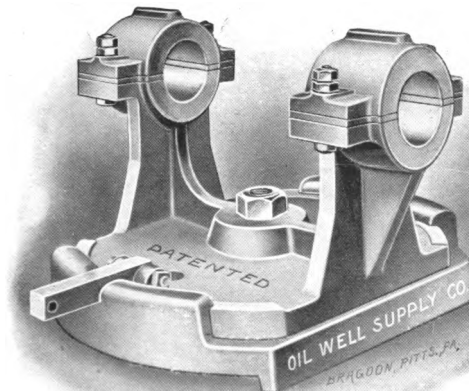
End view of Combination Rig

This rig embodies the principles of both the standard Cable Rig and the Hydraulic Rotary Rig. With the Combination Rig it is possible to drill through any formation.

The Cable Tools may be used to drill through hard strata whenever encountered.

The Walking Beam is mounted on a revolving center support, and when found desirable to use the Rotary Tools the Beam is swung aside, thus permitting the free passage of the hoisting lines to the drum.

The accompanying illustrations show the construction and alignment of the parts.

**REVOLVING CENTER IRONS FOR COMBINATION RIG****Fig. 2237**

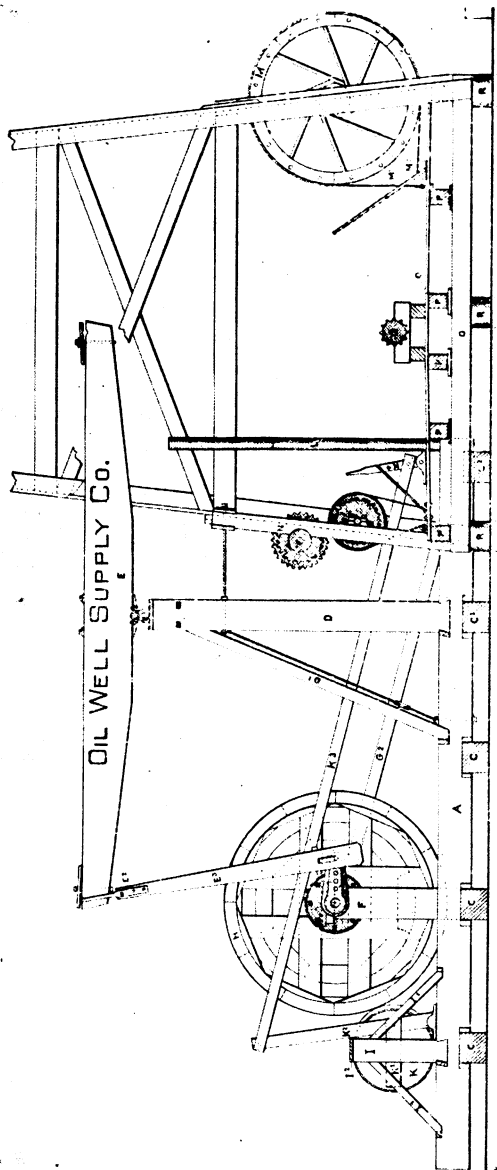
Complete - - - - - \$50 00

Weight, 315 lbs.



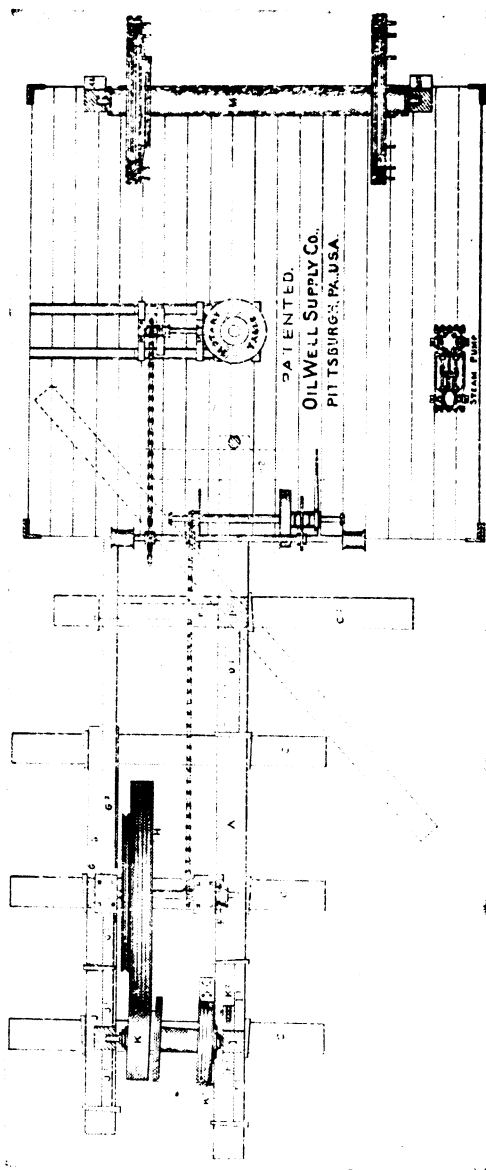
## COMBINATION RIG

Fig. 1272



Side elevation

Fig. 1273



Ground-plan

## COMBINATION RIG

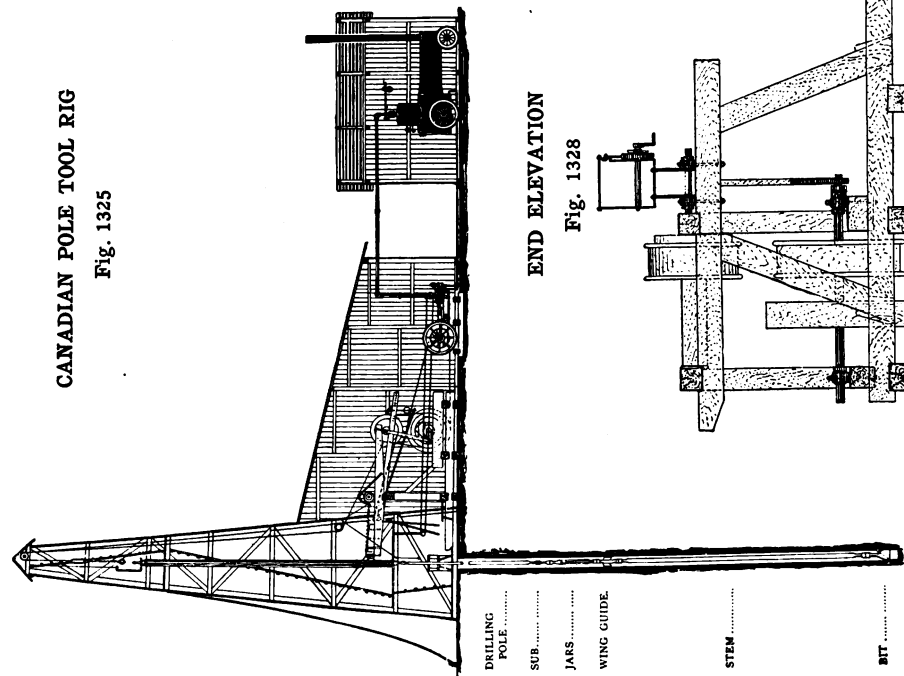
|                                                                    | Weight, lbs. | Price      |
|--------------------------------------------------------------------|--------------|------------|
| Complete Combination Rig consisting of                             |              |            |
| All timbers squared and framed - - - - -                           |              |            |
| Bolted derrick, 72 feet high - - - - -                             |              |            |
| Sectional bull wheels - - - - -                                    | 50,000       | \$1,000 00 |
| Sectional band and tug wheel - - - - -                             |              |            |
| Corbett patent sand reel - - - - -                                 |              |            |
| Walking beam with patent revolving center irons - - - - -          |              |            |
| Hoisting apparatus, fig. 2212, page 22 - - - - -                   | 2,000        | 250 00     |
| 12-inch rotary table, fig. 2211, page 21 - - - - -                 | 1,900        | 400 00     |
| 100 ft. No. 103 sprocket chain, fig. 2200 - - - - -                | 400          | 62 00      |
| 4-20 inch bushed derrick pulleys, fig. 2204, see page 55 - - - - - | 250          | 48 00      |
| 1 sprocket wheel for main shaft - - - - -                          | 100          | 10 00      |
| Total - - - - -                                                    | 54,650       | \$1,770 00 |

Specifications for Timbers and Lumber with Blue Prints showing construction supplied to purchasers.

For detailed prices of parts of Rig Irons, Bull Wheels, Band Wheels, etc., see index.

For detailed prices of Hydraulic Tools, see pages 189-192.

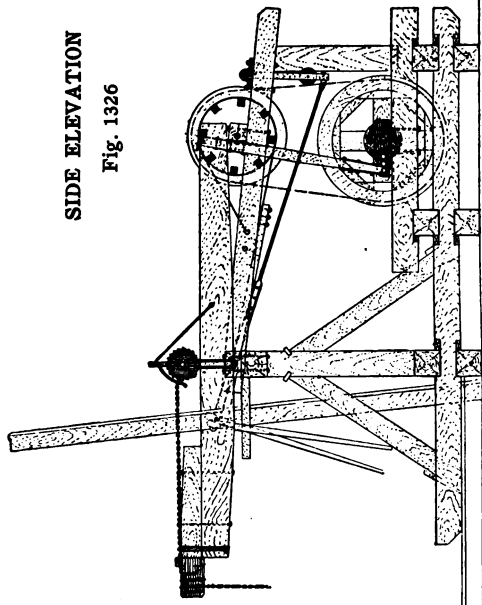
Any outfit of Cable Tools may be used with this Rig.



CANADIAN POLE TOOL RIG

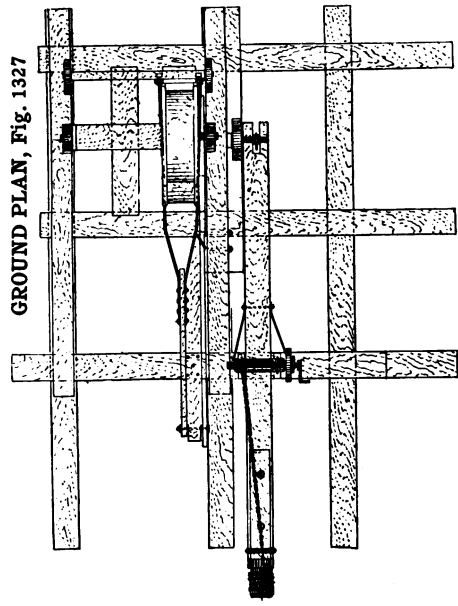
Fig. 1325

DRILLING  
POLE .....  
SUB. ....  
JARS .....  
WING GUIDE.  
  
STEM .....  
BIT .....

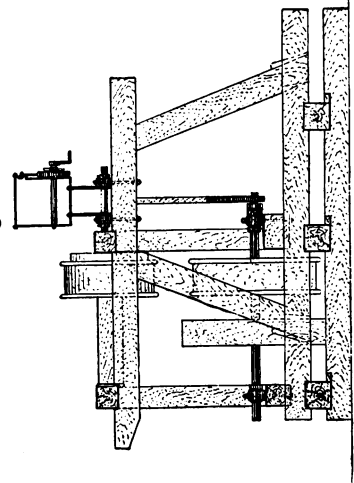


SIDE ELEVATION

Fig. 1326



GROUND PLAN, Fig. 1327



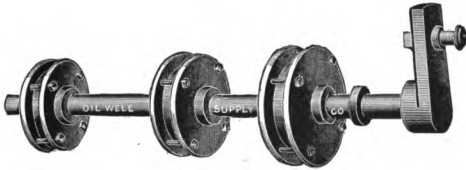
END ELEVATION

Fig. 1328

# CANADIAN POLE TOOL RIG PARTS

**SHAFT, CRANK, AND FLANGES**

**Fig. 2000**



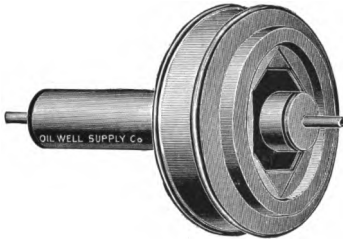
**DRIVE WHEEL**

**Fig. 2001**



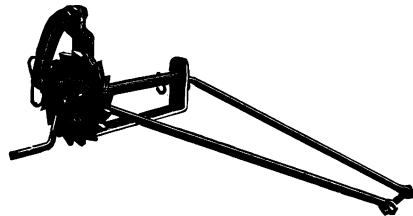
**SPOOL**

**Fig. 2002**



**SLIPPER OUT**

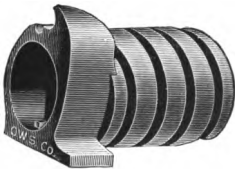
**Fig. 2025**



Complete with single dog

**JACKET**

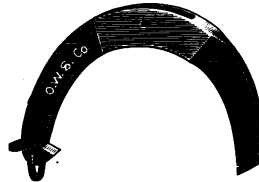
**Fig. 2034**



For spring pole

**DOUBLE DOG**

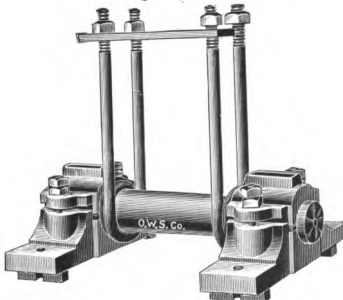
**Fig. 2027**



For slipper out

**CENTER IRONS**

**Fig. 2031**



Complete

**BEAM YOKE**

**BOLT**

**Fig. 2036**



**KING BOLT**

**Fig. 2039**



## CANADIAN POLE TOOL RIG PARTS

DRILL CHAIN AND SWIVEL

Fig. 2050



COW SUCKER

Fig. 2052



Complete

SPOOL CHAIN AND SWIVEL

Fig. 2055



PITMAN STRAPS AND BRASSES

Fig. 2045



WRIST PIN

Fig. 2042

NODDLE PIN  
STAPLE

Fig. 2047



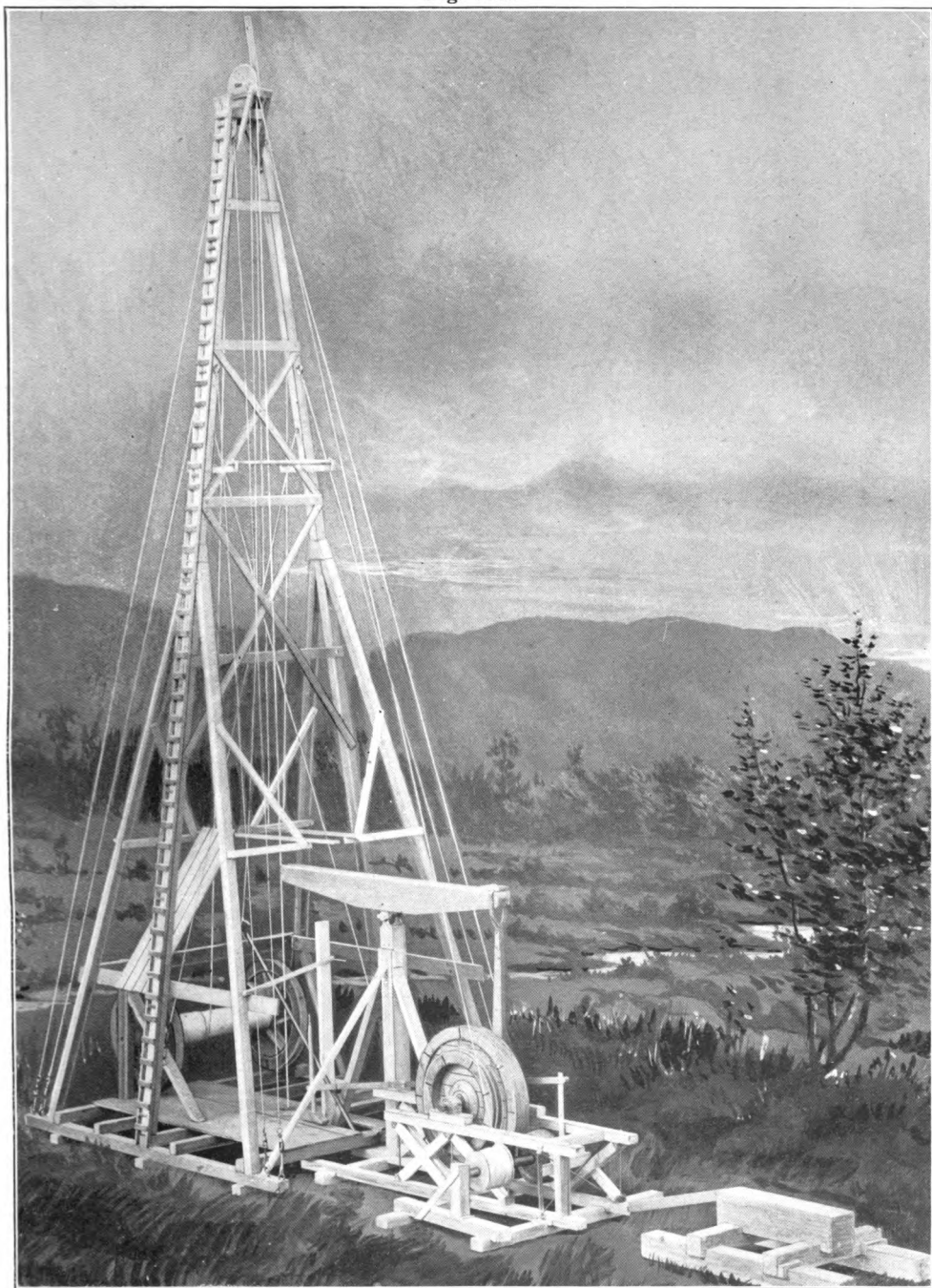
The pole tool system is still in use in the oil district of Ontario, Canada, but it has been supplanted by the cable system in all the great oil fields of the United States.

For illustrations of Canadian tools, see pages 194 to 197.

For prices of drill poles and joints, see page 193.

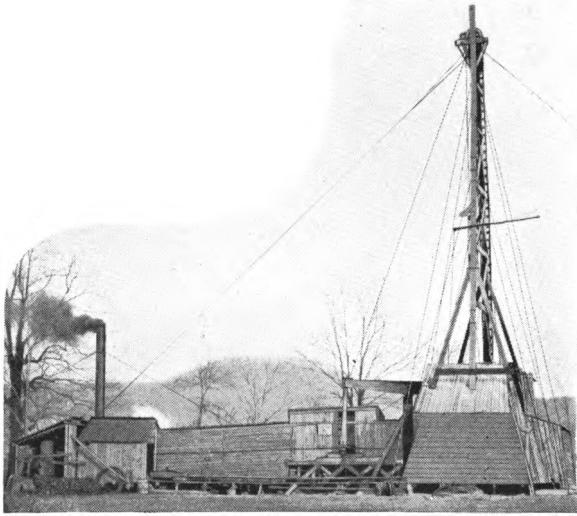
## THE KNUPP RIG

Fig. 1278



For description and price see next page.

## THE KNUPP RIG



Reproduced from photograph of Rig in operation, drilling at a depth of 3,500 feet.

The Knupp Rig illustrated on page 29 is made in various sizes with derricks ranging in height from 48 to 72 feet.

The standard size rig has a 72 foot derrick, the main standards of which are 7x9 inch timbers. This rig is fitted with regular band wheel, bull wheels and rig irons as are required to do the work in the different oil or gas fields.

The trussed main sills and derricks are shipped in sections of suitable size for convenient handling and with all necessary bolts, washers and special irons for erecting.

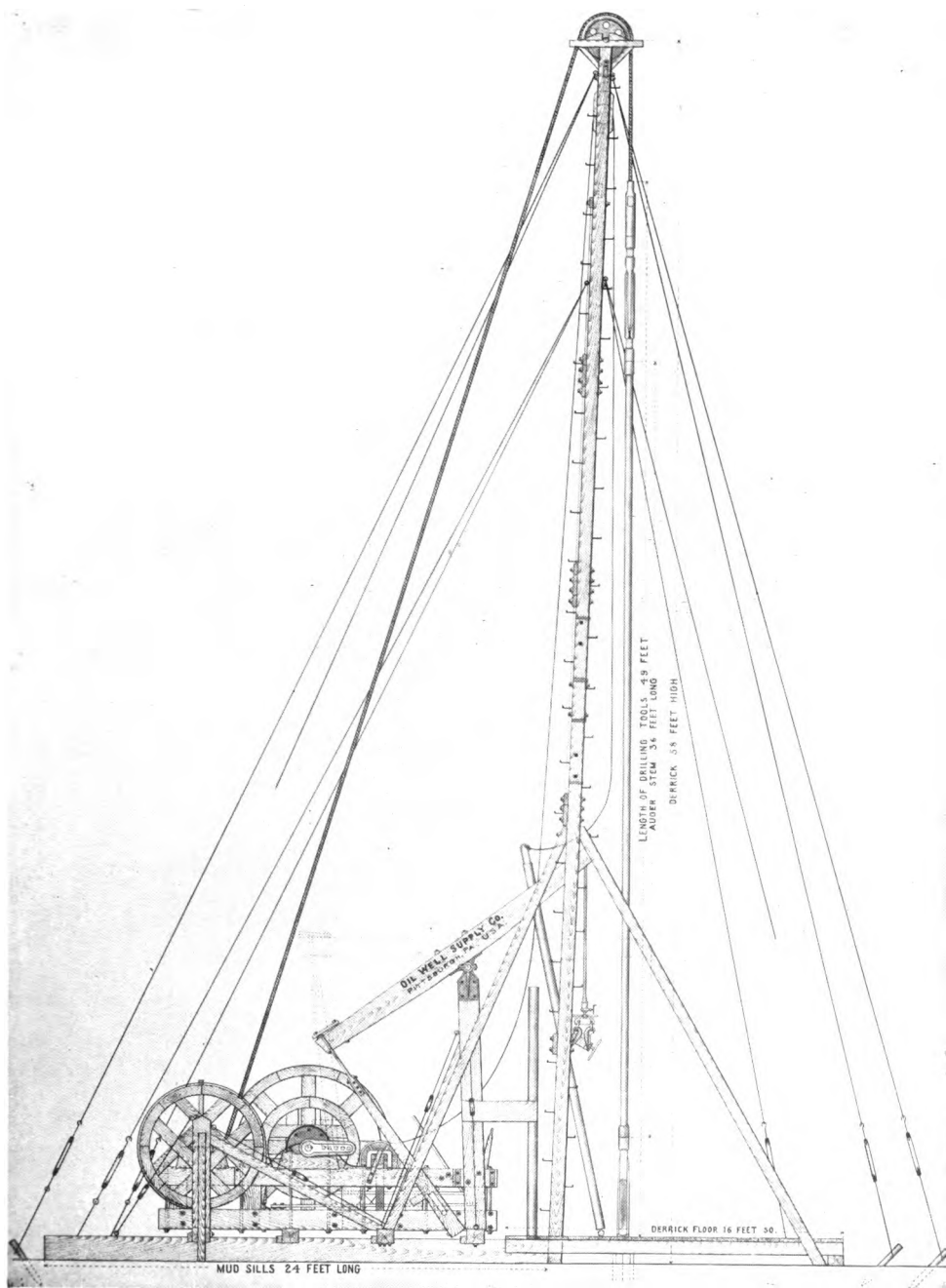
The derricks should be put together extended on the ground and hoisted by using one of the corner braces for a gin pole. The brace is fitted with ring bolts for this purpose.

The guy wires are half-inch galvanized wire fastened to top of derrick and to foundation with eye bolts and fitted with turn-buckles for adjusting.

Price of complete rig for deep drilling, with 72 foot derrick, 4½ inch rig irons, 10 foot band wheel and iron sand reel - - - - - \$700 00

**PARKERSBURG RIG**

Fig. 1316

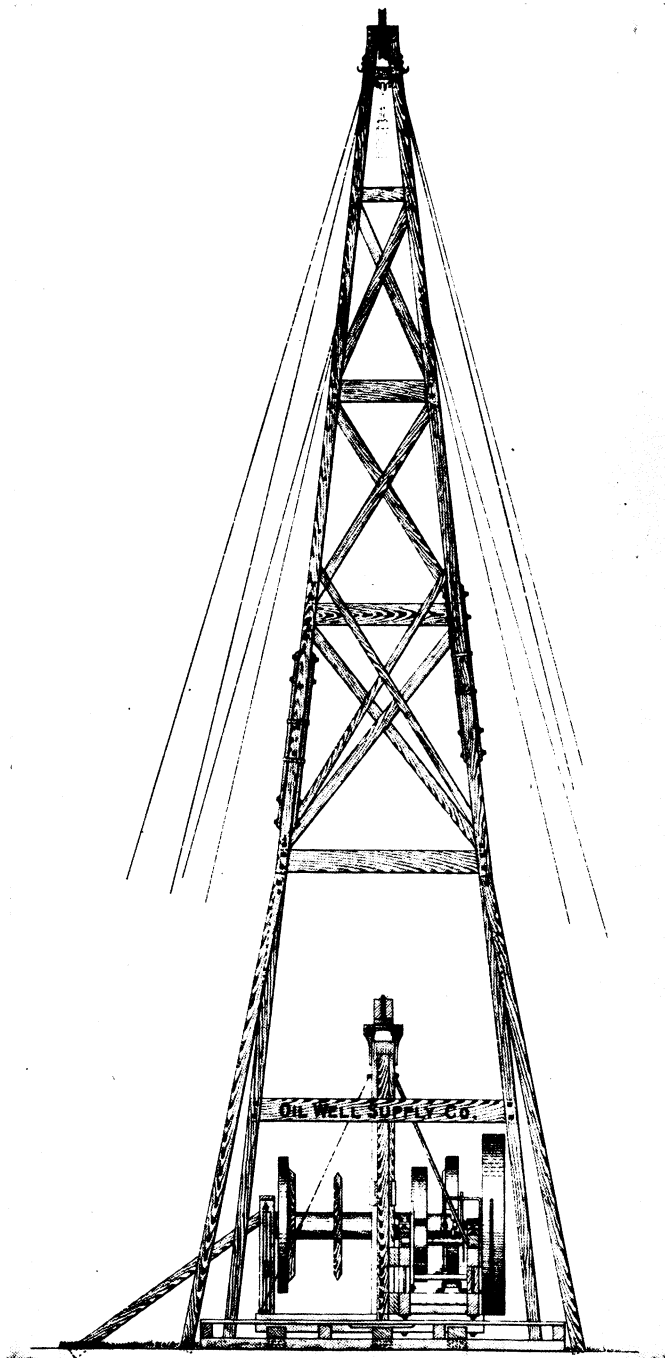


Side View



**PARKERSBURG RIG**

Fig. 1317



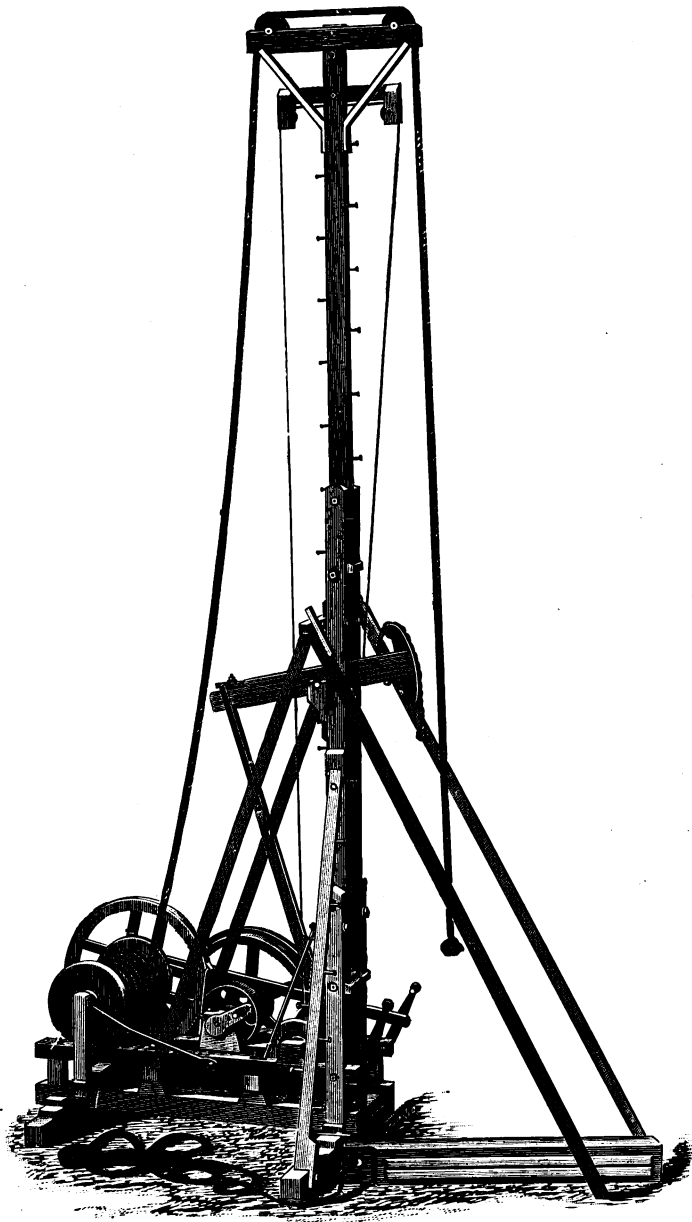
End View

Shipping weight, 24,000 pounds  
Price, \$500.00

CORBETT PORTABLE DRILLING RIG

SEGMENT WALKING BEAM, CHAIN AND CLEVIS, DOUBLE WHEELS FOR CABLE  
AND SAND LINE. FOR DRILLING 300 FEET

Fig. 1275



This and the portable rigs illustrated on pages 34 to 38 are adapted to drill wells from 300 to 1,000 feet, although deeper wells have been drilled with them. Power is applied to the band wheel by belt from an engine. The sand reel is operated by friction, applied by a lever; bull wheel by friction, or a chain and clutch. These rigs are simple, inexpensive, easily repaired, and strong. Price - - - - - \$400 00

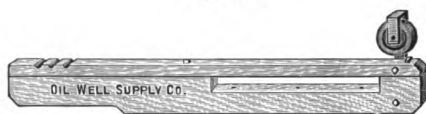
## CORBETT PORTABLE DRILLING RIG WITH COMMON WALKING BEAM

Fig. 1280

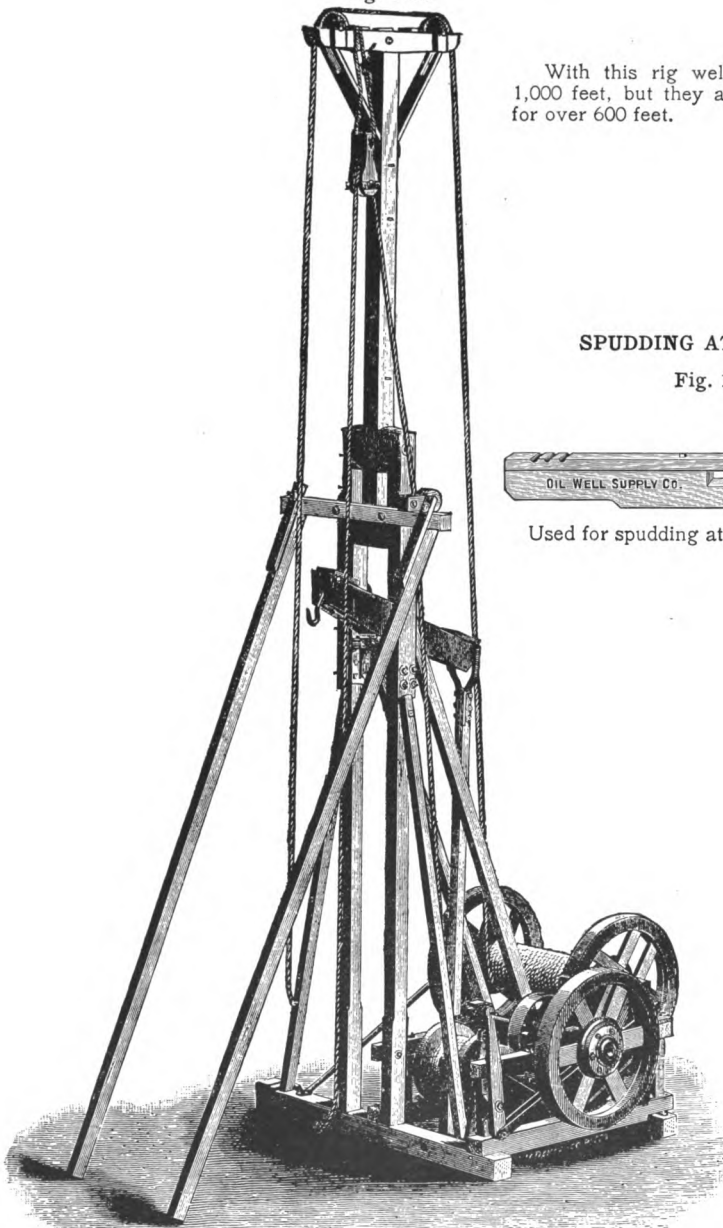
With this rig wells have been drilled 1,000 feet, but they are not recommended for over 600 feet.

### SPUDDING ATTACHMENT

Fig. 1277



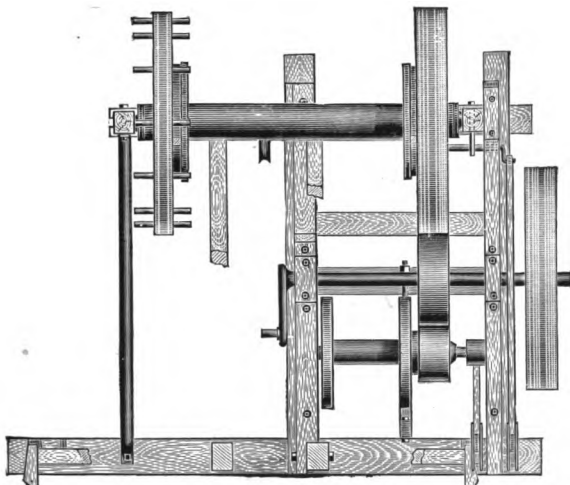
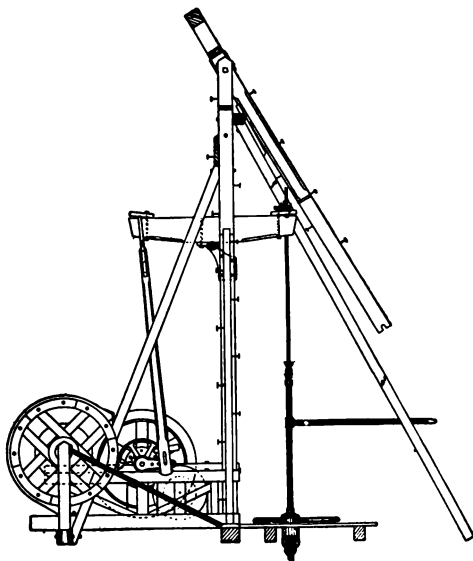
Used for spudding at the top of the well.



|                                                        |           |          |
|--------------------------------------------------------|-----------|----------|
| Complete rig, fig. 1280, without drive pipe attachment | - - - - - | \$585 00 |
| Complete rig, fig. 1280, with drive pipe attachment    | - - - - - | 620 00   |

**CORBETT PORTABLE DRILLING RIG****GROUND PLAN**

Showing arrangement of timbers, wheels, and parts

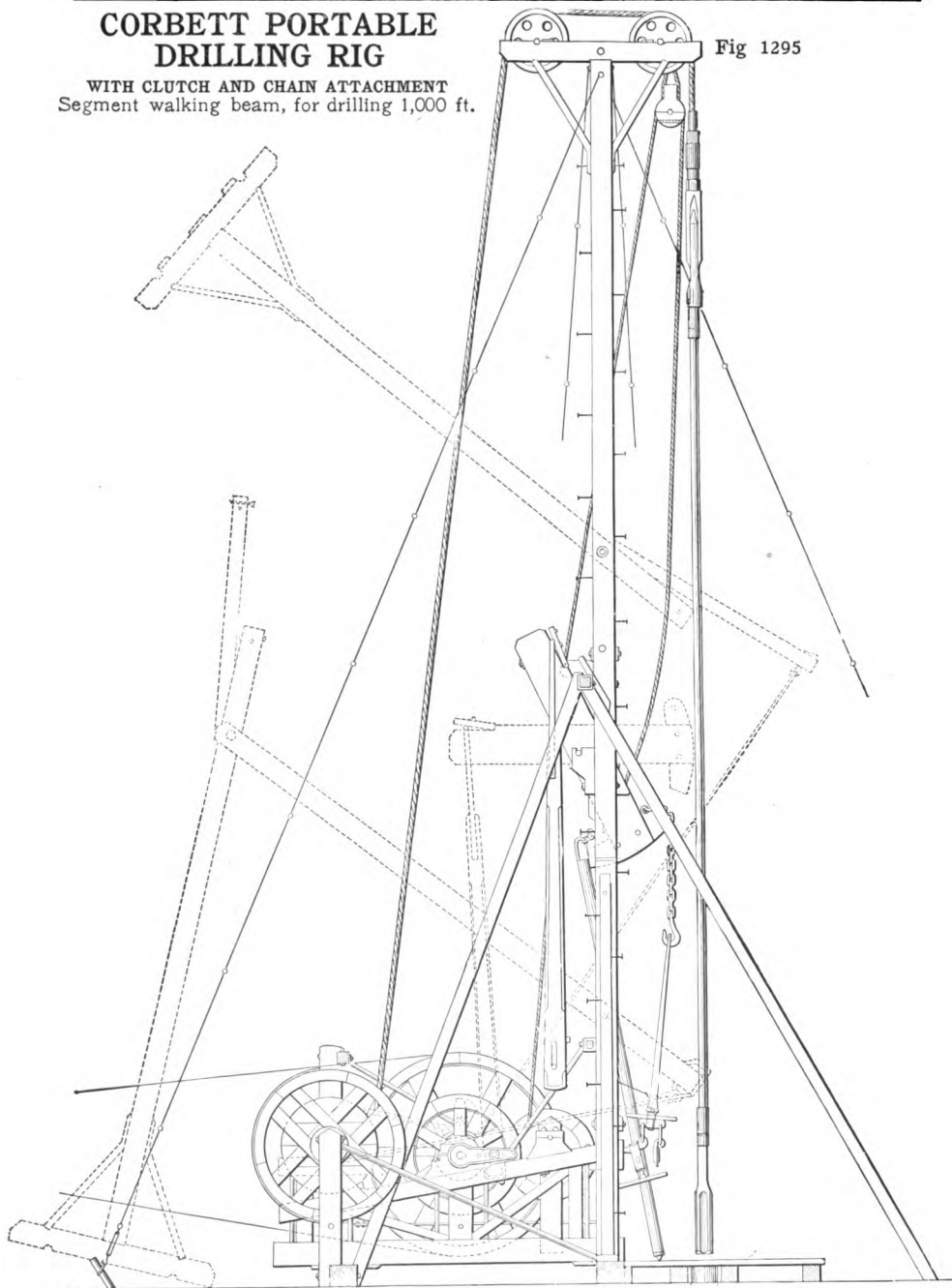
**Fig. 1290****Fig. 1292**

Arranged for pumping.

# **CORBETT PORTABLE DRILLING RIG**

WITH CLUTCH AND CHAIN ATTACHMENT  
Segment walking beam, for drilling 1,000 ft.

Fig 1295

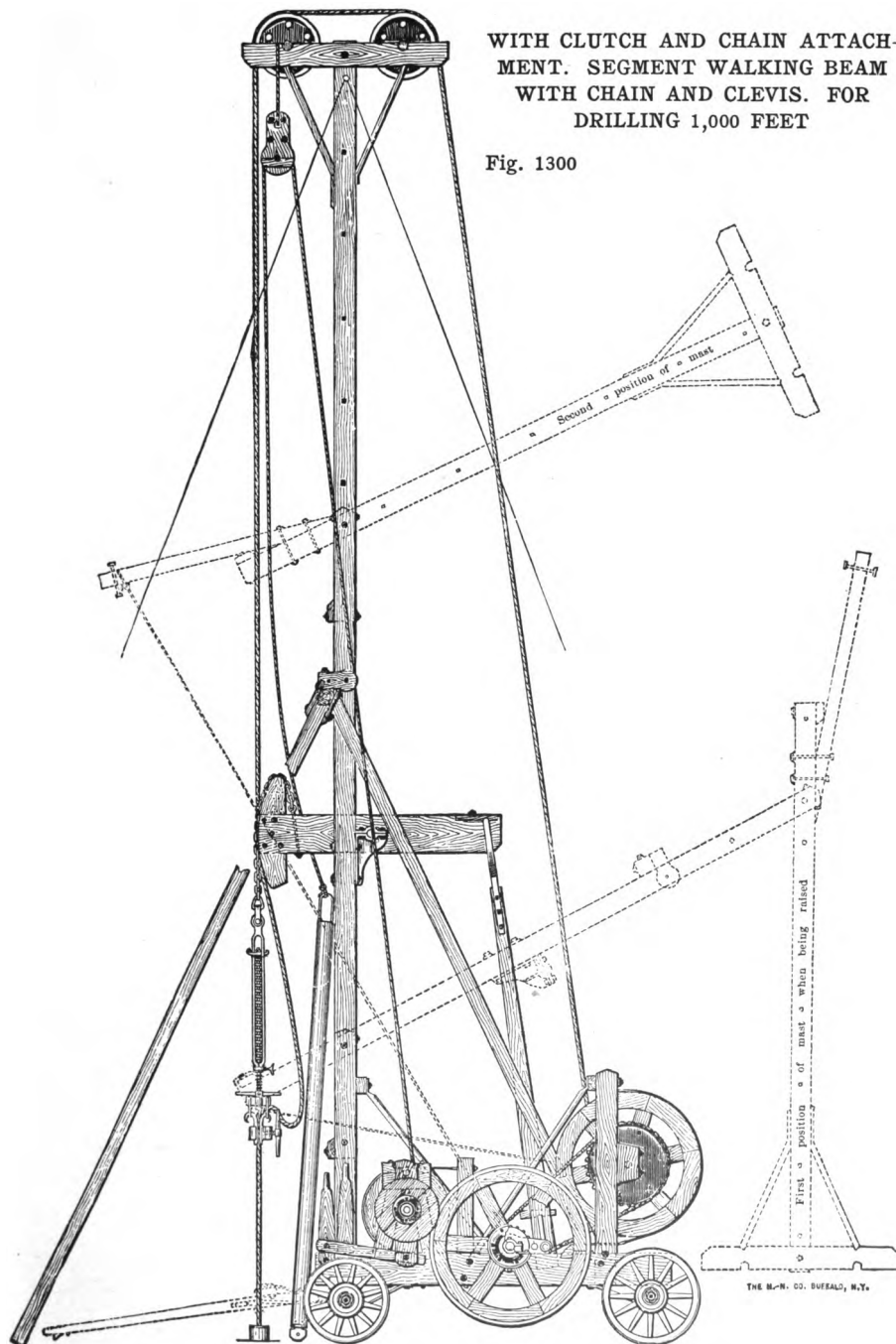


|                               |       |          |
|-------------------------------|-------|----------|
| Price                         | ----- | \$690 00 |
| Drive pipe attachment (extra) | ----- | 35 00    |

# MOUNTED CORBETT PORTABLE DRILLING RIG

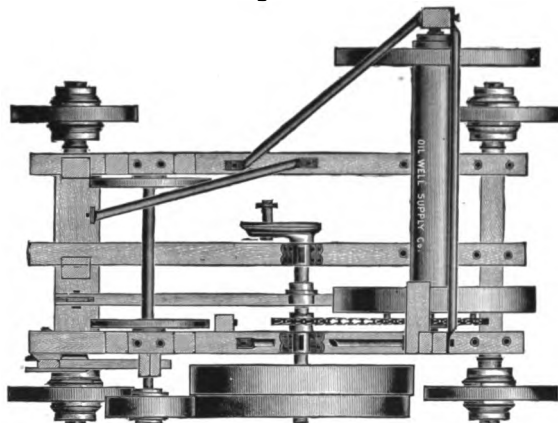
WITH CLUTCH AND CHAIN ATTACHMENT. SEGMENT WALKING BEAM WITH CHAIN AND CLEVIS. FOR DRILLING 1,000 FEET

Fig. 1300



## GROUND PLAN OF MOUNTED CORBETT PORTABLE DRILLING RIG

Fig. 1301

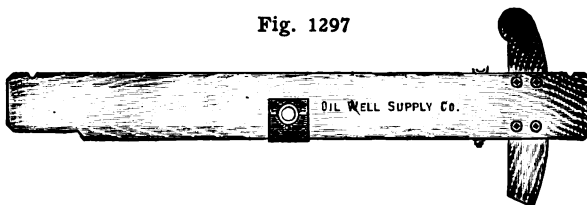


Mounted Portable Drilling Rig, Fig. 1300, page 37 - - - - - \$800 00

This illustration, also those on pages 36 and 37, will show the substantial character of the Corbett Portable Drilling Rigs, mounted or unmounted. The parts are strong, well made, and if anything breaks it can be easily repaired. The sand-reels on all are operated by friction. In the larger rigs the bull wheels are operated by a chain attachment running from the main shaft, power being applied by a clutch. Friction power for operating bull wheels, for deep drilling, is not recommended. Mounted rigs are like the others, with the exception of the wheels. Before drilling, the wheels should be taken off, or something solid placed under the axles, so that the axles and wheels will not be subjected to the jar and strain of drilling. Any of the rigs shown can be furnished mounted, if desired.

### SEGMENT WALKING BEAM

Fig. 1297



### SEGMENT WALKING BEAM CENTER IRONS

Fig. 1296



### TOP VIEW OF SEGMENT WALKING BEAM

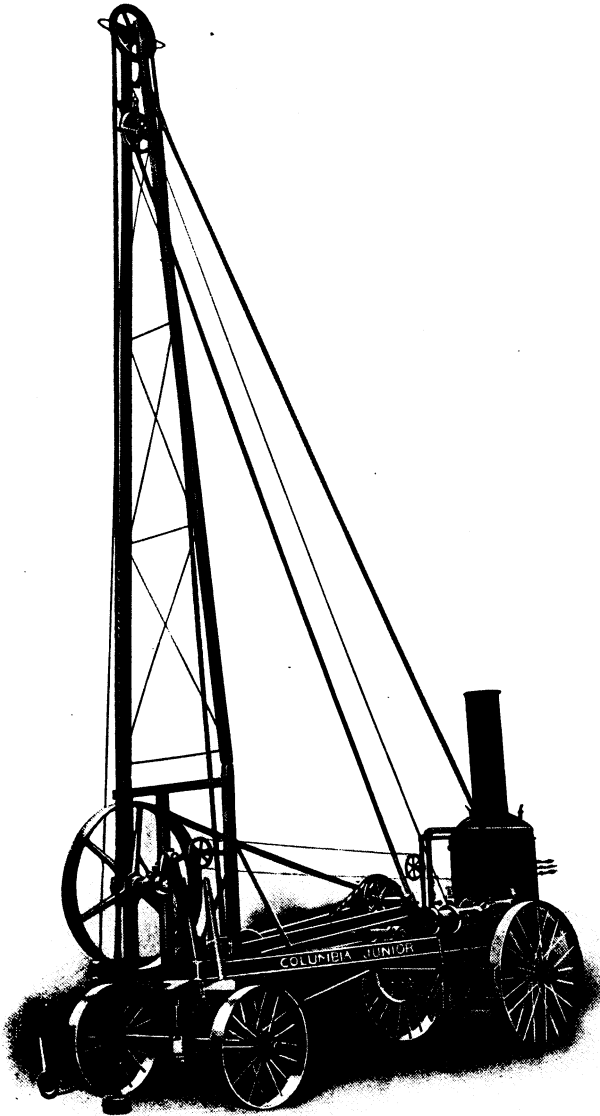
Fig. 1298



## COLUMBIA PORTABLE DRILLING MACHINES

Are built of iron and steel, are practically indestructible, and are unaffected by climatic conditions. They are built in five sizes. The lightest, or No. 1, is a simple spudding machine. The others combine spudding arrangements and walking beam action. They are furnished, when desired, with traction, and can be equipped with rotary devices, thus covering the entire field of drilling, from the shallow test or blast drill to the deepest oil and gas wells.

**No. 1 OR COLUMBIA JUNIOR DRILLING MACHINE. Fig. 1309**

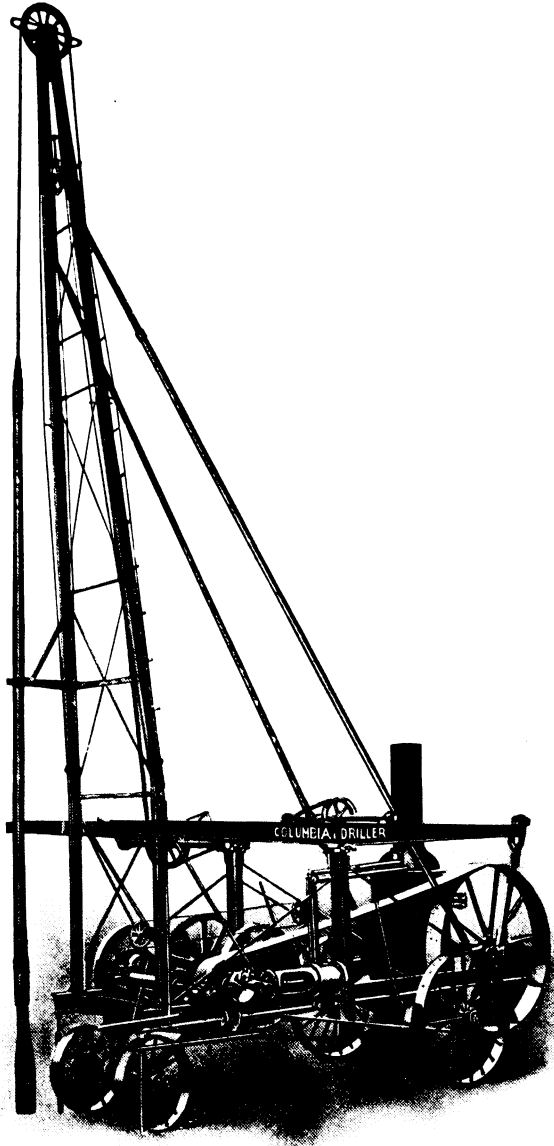


For Water Wells, test bores or blast drills.

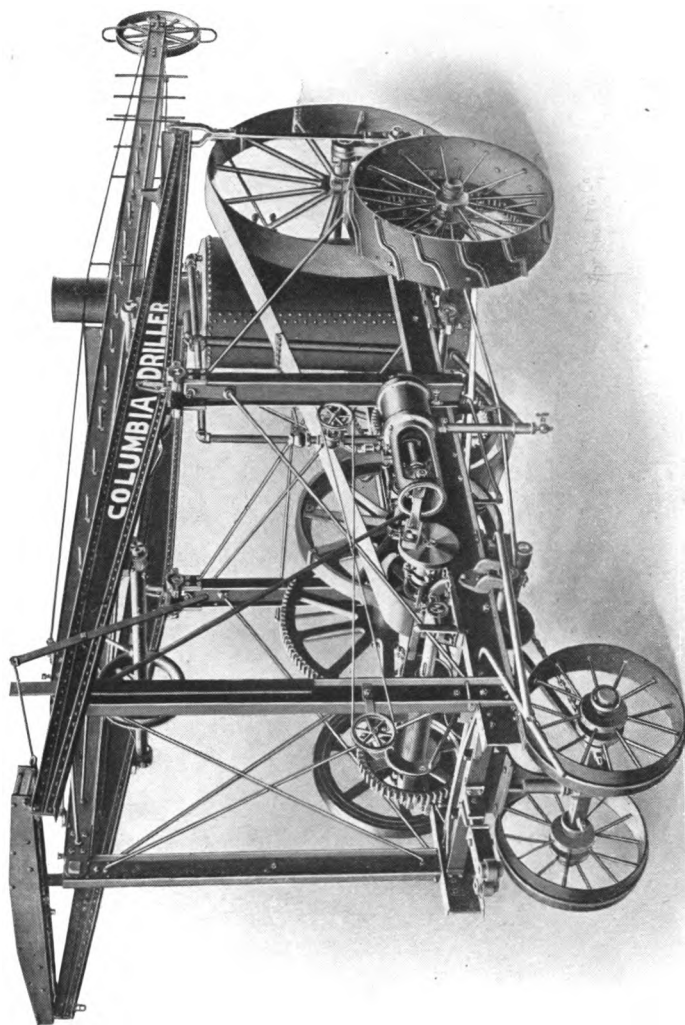


**NO. 3 COLUMBIA DRILLING MACHINE**

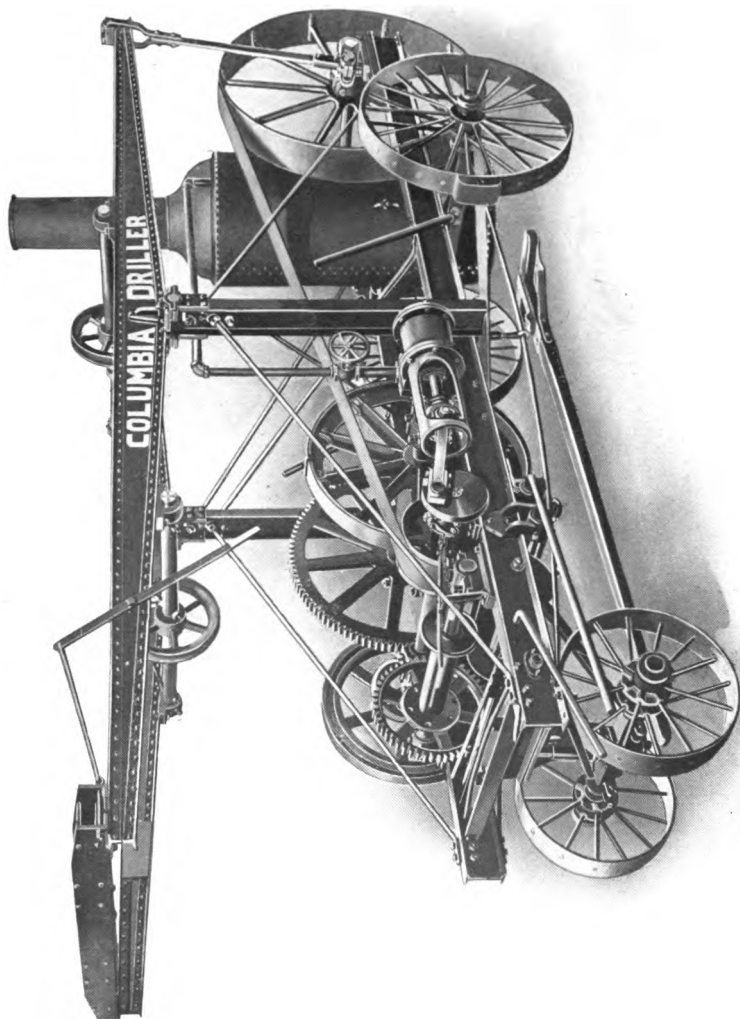
Fig. 1302



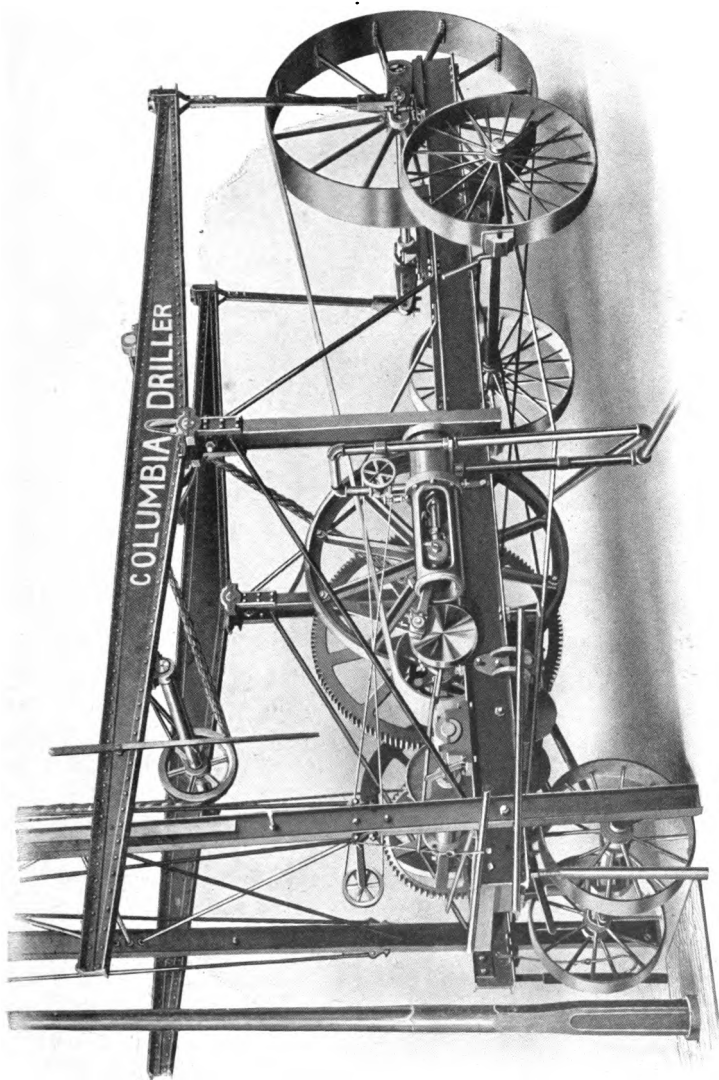
The No. 3 Drilling Machine is the smallest built with Walking Beam. With a capacity for drilling to a depth of 1000 feet, this machine is successfully used for cleaning out wells of considerable depth, and may also be used for handling sucker rods and tubing, as well as pumping.

**THE NO. 3 TRACTION COLUMBIA DRILLING MACHINE****Fig. 1306**

The No. 3 Traction Drilling Machine is built similarly to the No. 3 Portable, except that the mast is hinged. The traction arrangement whereby the machine is enabled to propel itself over rough country is under the complete control of the operator from one point. The same arrangement is followed on the No. 1 Traction machine.

**NO. 5 COLUMBIA DRILLING MACHINE****Fig. 1305**

The No. 5 Drilling Machine is designed to meet a popular demand for a machine of moderate weight, but sufficient capacity for drilling oil and gas wells. It has a nominal capacity for drilling to a depth of 1000 feet and may be used to clean out wells to a depth of 3000 feet. This machine has a separate mast which rests on the ground and secured to the frame of the machine.

**COLUMBIA DRILLING MACHINE, SPUDDING****Fig. 1304**

The No. 8 and No. 10 Drilling Machines are similar in general dimensions and differ merely in weight and capacity. In spudding with the Columbia Drilling Machines the motion is secured through the movement of the walking beam and it is not necessary to stop the engine or change the cables when it is required to withdraw the tools.

Fig. 1308

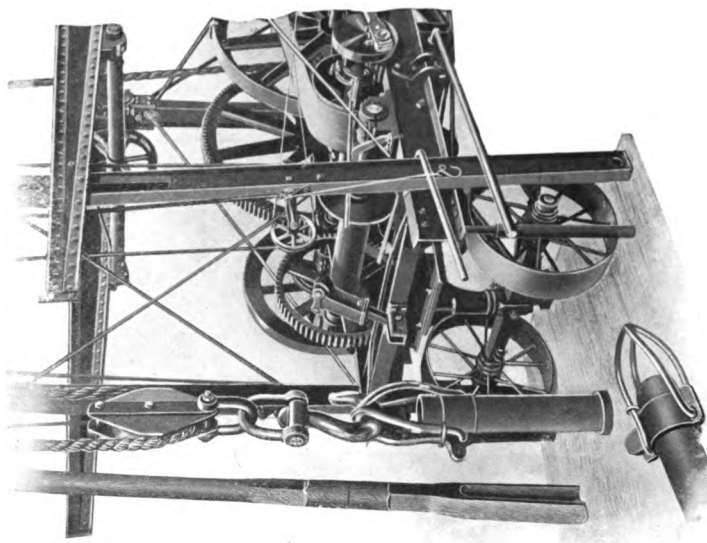
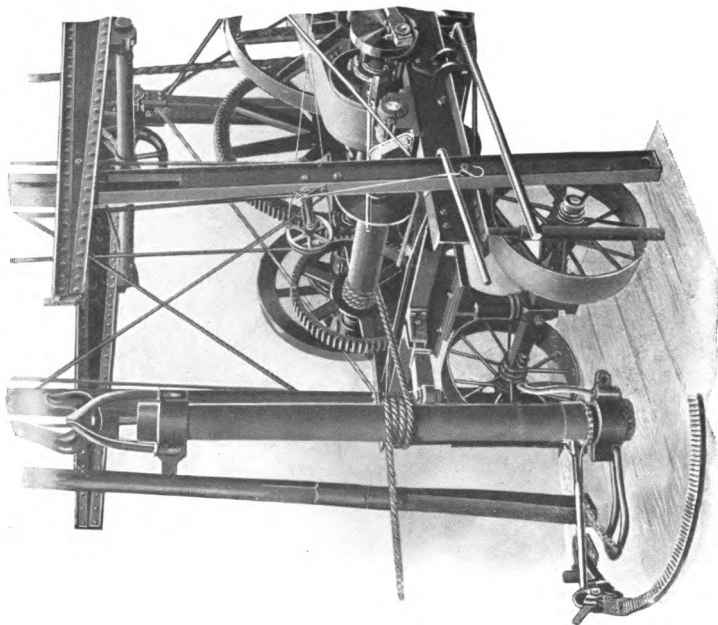
Columbia Drilling Machine Lowering Casing.  
Casing Turner Thrown Back.

Fig. 1307



Columbia Drilling Machine Turning Casing.

## DIMENSIONS, WEIGHTS AND PRICES OF COLUMBIA DRILLING MACHINES

|                               | No. 1<br>Junior | No. 1<br>Traction | No. 3   | No. 3<br>Traction | No. 5   | No. 8   | No. 10  |
|-------------------------------|-----------------|-------------------|---------|-------------------|---------|---------|---------|
| Capacity, ft. - - - -         | 150             | 150               | 1000    | 1000              | 1000    | 1500    | 2500    |
| Engine Cylinder, in. - - -    | 5x6             | 5x6               | 8x8     | 8x8               | 9x9     | 9x12    | 10x12   |
| Belt length, ft. - - - -      | 28½             | 28½               | 40      | 40                | 42      | 48      | 48      |
| Belt width, in. - - - -       | 6               | 6                 | 10      | 10                | 10      | 12      | 14      |
| Height of mast, ft. - - -     | 29              | 29                | 50      | 40                | 50      | 60      | 60      |
| Band wheel diam., in. - - -   | 48              | 48                | 72      | 72                | 80      | 90      | 90      |
| Band wheel face, in. - - -    | 6               | 6                 | 10      | 10                | 10      | 12      | 14      |
| Engine pulley diam., in. - -  | 10              | 10                | 14      | 14                | 16      | 20      | 20      |
| Engine pulley, face, in. - -  | 6               | 6                 | 10      | 10                | 10      | 12      | 14      |
| Length walking beam, ft. - -  | - - - -         | - - - -           | 17½     | 17½               | 20½     | 23½     | 23½     |
| Length temper screw, ft. - -  | - - - -         | - - - -           | 5½      | 5½                | 5½      | 6½      | 6½      |
| Diameter of stem, in. - - -   | 3½              | 3½                | 3½      | 4                 | 4       | 4½      | 4½      |
| Length of stem, ft. - - - -   | 14              | 14                | 30      | 20                | 30      | 34      | 40      |
| H. P. of Boiler - - - -       | 5               | 5                 | 15      | 15                | 18      | 20      | 20      |
| Wagon wheels diam., in. - -   | 24x48           | 24x48             | 32x54   | 32x54             | 32x54   | 32x54   | 32x54   |
| Wagon wheel tires, in. - - -  | 5               | 5                 | 6       | 6                 | 8       | 8       | 8       |
| Weight with boiler, lbs. - -  | 5300            | 6000              | 9000    | 10000             | 12000   | - - - - | - - - - |
| Weight without boiler, lbs. - | - - - -         | - - - -           | 8000    | - - - -           | 10700   | 12000   | 18000   |
| Price with boiler - - - -     | \$960 00        | 1025 00           | 1280 00 | 1530 00           | 1535 00 | - - - - | - - - - |
| Price without boiler - - - -  | - - - -         | - - - -           | 1045 00 | - - - -           | 1255 00 | 1555 00 | 2000 00 |

The rated capacity of the machines is merely an indication of the depth to which they will drill rapidly and economically when compared with the stationary wooden oil country rig. Any of them will drill much deeper under favorable conditions.

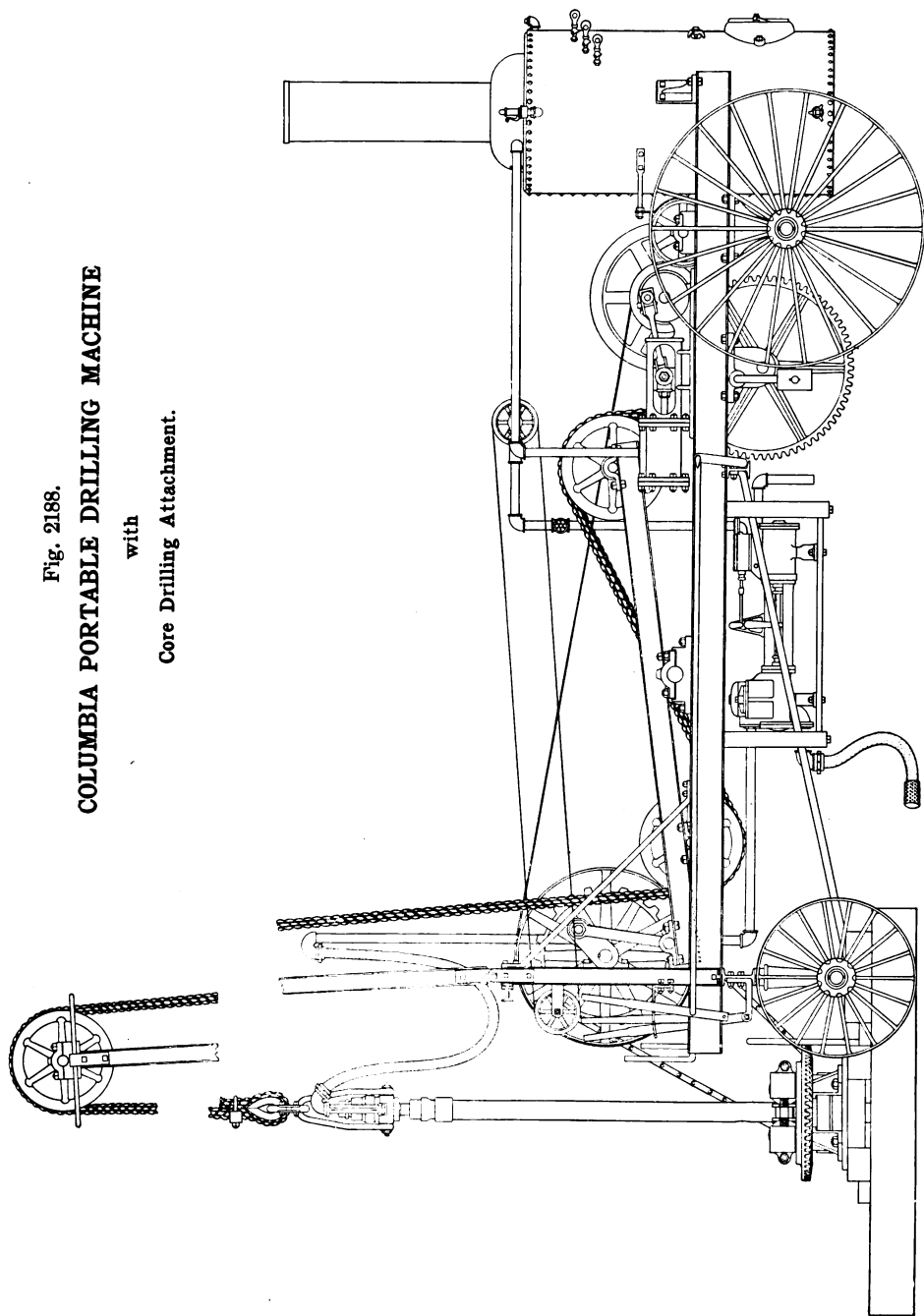
The No. 5, No. 8 and No. 10 machines are not ordinarily equipped with boiler on frame.

The regular oil country boiler may be used advantageously.

Fig. 2188.

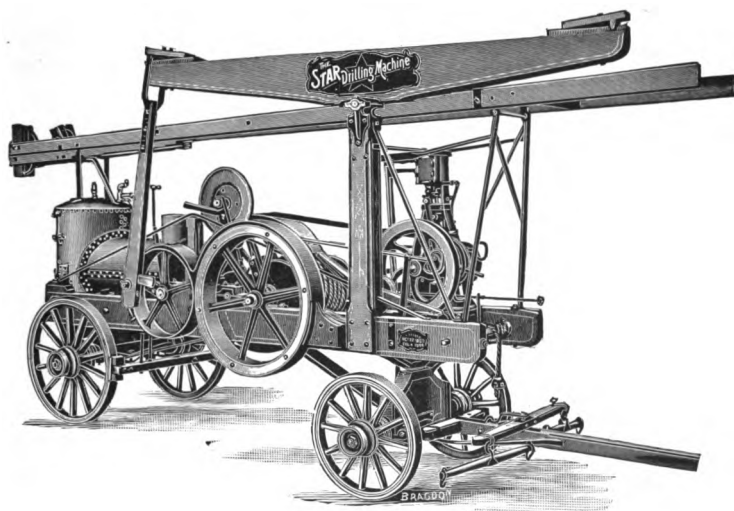
**COLUMBIA PORTABLE DRILLING MACHINE**

with  
Core Drilling Attachment.



## THE STAR DRILLING MACHINE

Fig. 1315



### PRICES OF MACHINES WITHOUT ROPES AND TOOLS

|        |           |
|--------|-----------|
| No. 15 | -\$540 00 |
| No. 16 | - 650 00  |
| No. 17 | - 550 00  |
| No. 18 | - 715 00  |
| No. 19 | - 790 00  |
| No. 20 | - 875 00  |
| No. 21 | - 960 00  |
| No. 22 | - 1050 00 |
| No. 23 | - 1160 00 |
| No. 24 | - 1270 00 |
| No. 25 | - 1380 00 |
| No. 26 | - 1600 00 |
| No. 27 | - 1740 00 |
| No. 28 | - 1830 00 |



## OUTFITS FOR SINKING WELLS OF LARGE DIAMETER THROUGH SOFT FORMATIONS AND GLACIAL DRIFTS

As shown in the preceding pages, the Cable System, used throughout the principal petroleum fields of America, is the best for hard formations; the Hydraulic Rotary System for formations composed of soft sedimentary deposits, or beds of sand; the Combination System for localities where both conditions are found, but glacial drift, where boulders, or heavy gravel beds are encountered, can best be overcome by a special method known as the "Stovepipe and Mud Scow" system.

This has been brought to a high degree of practicability. It is particularly adapted for sinking water wells where the chief desideratum is a large supply, obtainable only from a well with large diameter.

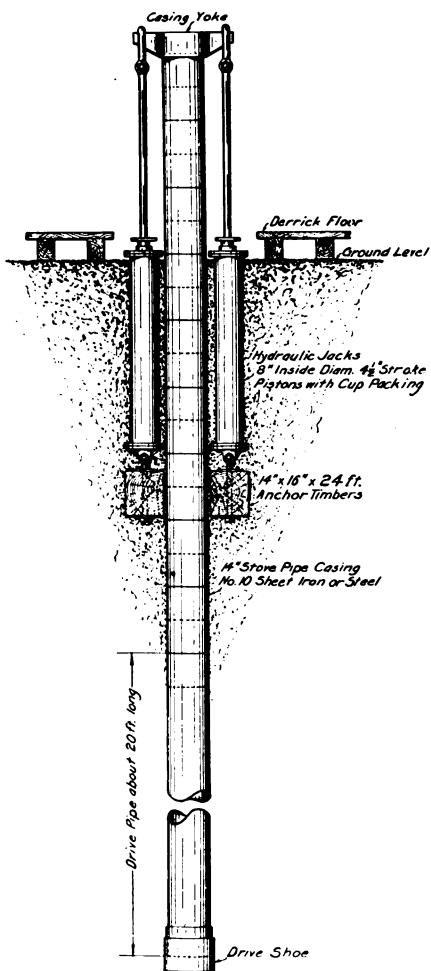
### THE DISTINCTIVE FEATURES ARE

A portable ladder derrick, ranging in height from 34 to 36 feet, mounted on heavy trucks. The "Mud Scow," a tool combining the properties of a cutting bit and sand pump. The "Stovepipe" Casing, or riveted pipe.

Hydraulic Jacks anchored to heavy timbers and used in forcing down the casing. The "Perforator" for making perforations at any desired point in the pipe after it is placed in the well.

The inside diameter of the stovepipe casing (see Figs. 1318 and 1319) as usually used in lining wells for the purpose mentioned is 10, 12 and 14 inches, and occasionally 16 inches. It is made of sheet iron or steel from No. 14 to No. 10 U. S. gauge. The sheets are of sufficient size to roll into joints of casing of the required diameter and to finish 24 inches long. Each joint has a longitudinal-riveted seam, and after being riveted the ends are faced off by "turning," to make the joint true and exactly 24 inches long. A string of stovepipe casing is built up as indicated in Figs. 1318 and 1319, from a drive shoe and pipe with a double string of joints, one inside the other, thus making a flush joint casing practically smooth both inside and out.

Fig. 1318



## OUTFITS FOR SINKING WELLS OF LARGE DIAMETER THROUGH SOFT FORMATIONS AND GLACIAL DRIFTS

### THE DISTINCTIVE FEATURES—Continued

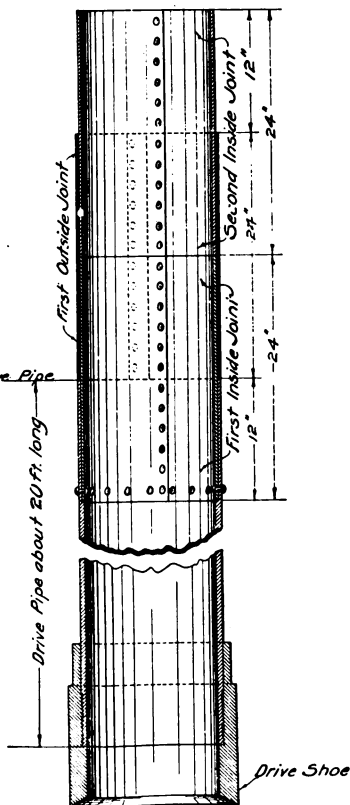
The drive shoe is a steel forging, finished to dimensions by turning, and formed with an annular cutting edge, somewhat larger in diameter than the outside of the casing. It is also recessed and sometimes threaded so the drive pipe may be shrunk on or screwed into it, to a butt joint. The stovepipe casing may be started from a properly recessed drive shoe, but it is easier to start a well straight and to keep it perfectly plumb by putting the drive shoe on a 20 foot length of drive pipe to act as a guide to the joints of stovepipe casing; the drive pipe should be heavy lap-welded pipe or casing, its outside diameter being fully equal to that of the outside joints of stovepipe casing to follow. This 20 foot drive pipe has to be recessed 12 inches at the top (see Fig. 1319) to take the first inside joint of stovepipe casing, which joint butts on the bottom of the 12-inch recess and is riveted to the drive pipe and extends 12 inches beyond it. Placing next the first outside joint of casing, it butts on the end of the 20-foot drive pipe and covers and extends 12 inches above the first inside joint.

Next will be the second inside joint butting on the first and extending 12 inches above the first outside joint. Next will be an outside joint butting on an outside joint, followed by an inside joint butting on an inside joint, each additional joint making the casing string 12 inches longer and so on to any length desired. The only fastening done between the joints is denting with a common pick. Joints of stovepipe casing do not fit together so as to be perfectly water tight, and it is not necessary they should for water well work. A string of casing is built up and forced into a well for lining the same as fast as drilling progresses by two and sometimes four hydraulic jacks. These jacks are placed upright at suitable distance apart and bolted to anchor timbers buried to the proper depth; also, the jacks are so arranged that they can be quickly linked to the lugs on the casing yoke for a down pull on the casing; all as indicated in Fig. 1318.

Fig. 1319



Sectional Plan.



## OUTFITS FOR SINKING WELLS OF LARGE DIAMETER THROUGH SOFT FORMATIONS AND GLACIAL DRIFTS

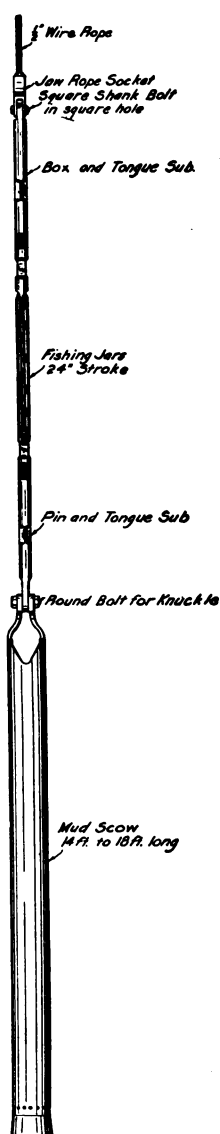
### THE DISTINCTIVE FEATURES—Concluded

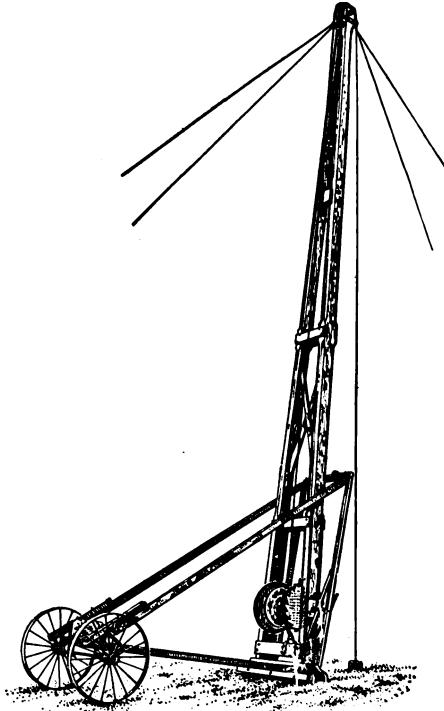
The mud scow is a combined drilling tool and sand pump, shown in fig. 1321, with the whole string of tools as commonly used in drilling wells of the class mentioned. This string consists of a jaw rope socket followed by a tongue and box sub, followed by the jars, followed by a pin and tongue sub, followed by the mud scow. The latter tool has the body of a common sand pump or bailer, and is made of a suitable piece of pipe; its bail is formed by two heavy ears by which it is connected to the tongue of the sub by a bolt, thus forming a knuckle joint used in dumping; it has a bottom similar to a California sand pump bottom. This bottom is a steel forging turned to dimensions with an annular cutting edge slightly larger in diameter than the body of the mud scow and fitted with a flat valve opening inwardly. This bottom is sometimes modified for drilling in clay or gumbo by a bit being forged across it and extending six inches or eight inches beyond the annular cutting edge.

The jars commonly used for work of this kind are the ordinary oil well fishing jars of 24-inch stroke, outside diameter  $5\frac{1}{4}$  inches, box diameter  $4\frac{1}{8}$  inches, pin and box 2 inches by 3 inches—7 flat thread; the diameter of the other parts of the string of tools to correspond.

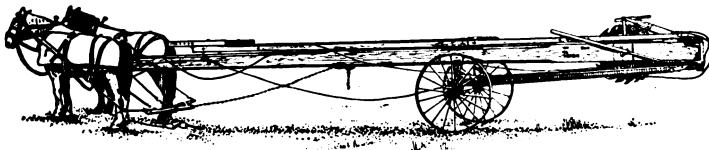
Further Information on Application.

Fig. 1321



**PORTABLE DERRICK****FOR PULLING RODS, TUBING OR CASING****THE IRISH PULLING MACHINE****Fig. 1340**

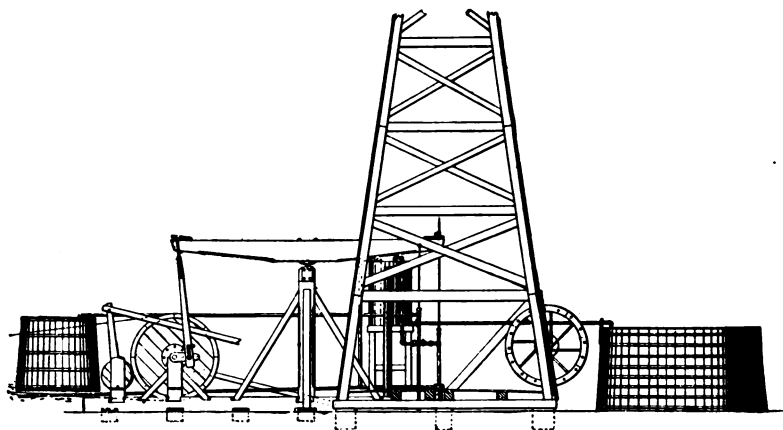
The Irish Pulling Machine is designed for pulling casing, tubing and sucker rods from oil and gas wells or for lowering same. The mast is made of solid timbers and has ample strength to do any work that may be ordinarily required. It can be raised to working position or lowered ready for transportation either by hand or horse power. The rods can be pulled by hand power. One team of horses can pull tubing from wells of 1200 ft. depth.

**Fig. 1341**

Height of Mast, 38 ft. Weight, 1900 lbs. Price, \$300.00

## PUMPING WELL

Fig. 1268



Water Tank

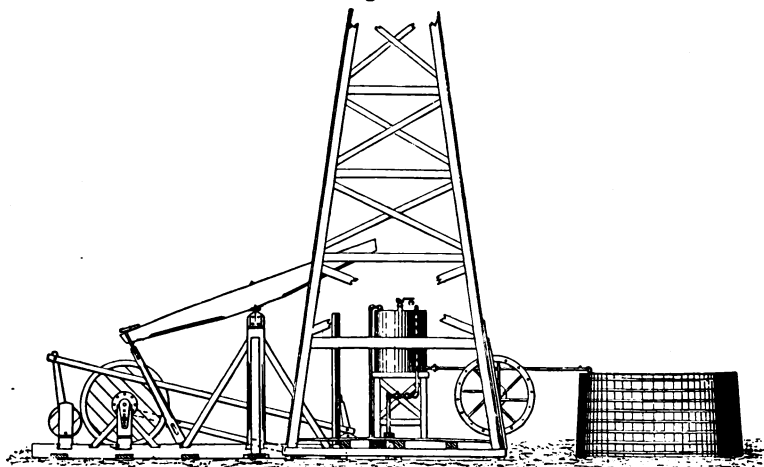
Gas Tank

Oil Tank

In this illustration a water well is shown as drilled a few feet from the oil well, on a line with the Samson post. The pumping rods of each well are attached to the walking beam and they are operated with the same stroke. The oil is pumped into the gas tank and is there separated by its own gravity from the gas. By means of a pipe connected to the bottom of the gas tank, the oil is conducted to the oil tank. The gas pipe extends from the upper part of the gas tank and conducts the gas to the boiler, where it is burned. Water is pumped direct from the water well to the water tank for use in the boiler.

## FLOWING WELL

Fig. 1270



The oil flows into the gas tank and is separated by its own gravity from the gas, and is then conducted to the large tank on the right. The gas is led by a pipe from the top of the gas tank and is used for either fuel or light. A gas tank is essential to separate the oil from the gas.

# IDEAL SECTIONS OF PUMPING AND FLOWING WELLS

## PUMPING WELL

## FLOWING WELL

Casing Head,  
Gas Pipes,  
Derrick Floor,  
Derrick Sills,  
Drive Pipe,  
Casing

Fig. 1350



Casing  
and  
Tubing

Fig. 1351



Tubing  
and  
Sucker Rods

Fig. 1352



Working Valves,  
Sucker Rods,  
Tubing,  
and Perforated  
Pipe

Fig. 1353



Tubing, Packer,  
and  
Perforated Pipe

Fig. 1362

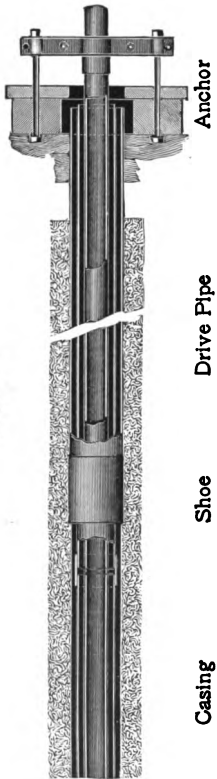


Fig. 1350 represents the simplest form of well construction, the drive pipe extending from the surface of the derrick floor to the solid rock, passing through the alluvial deposits and preventing all loose earth from falling in the well and clogging the tools. This is followed by the insertion of the "casing," passing through the drive pipe and extending to a sufficient depth to shut off all water from the oil-bearing rock below. In many formations it is necessary to use several "strings" of casing to shut off various caves or soft places in the wall of the well, each "string" being of a size permitting its easy passage through the preceding "string."

## IDEAL SECTIONS OF GAS WELL

ANCHOR, TUBING, DERRICK FLOOR, DERRICK SILLS,  
DRIVE PIPE, CASING

Fig. 1366



Casing

Shoe

Drive Pipe

Anchor

CASING AND TUBING

Fig. 1367



Tubing

Casing

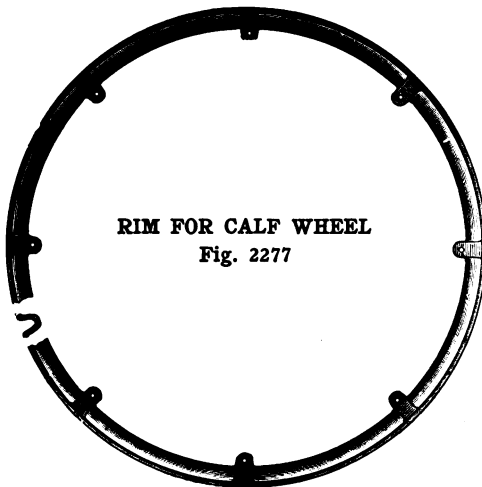
TUBING AND PACKER

Fig. 1368



Packer

## DETAILED PARTS OF STANDARD RIG—RIG IRONS



RIM FOR CALF WHEEL  
Fig. 2277

OUTER TUG WHEEL

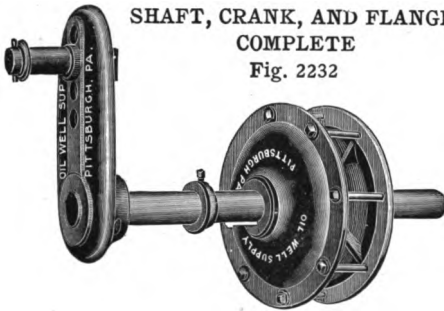
Fig. 2278



Attached to band wheel shaft for  
turning calf wheel.

For prices see page 56.

## DETAILED PARTS OF STANDARD RIG—RIG IRONS

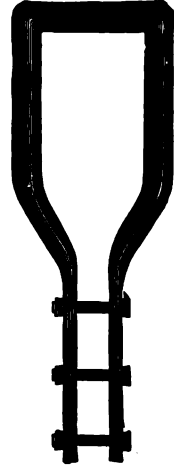


SHAFT, CRANK, AND FLANGES,  
COMPLETE  
Fig. 2232

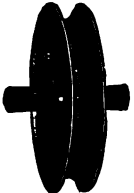


CENTER IRONS  
Fig. 2236

ROUND IRON  
STIRRUP  
Fig. 2235

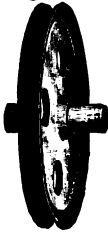


BUSHED  
SHEAVE  
Fig. 2204



For rotary rig  
For price see  
page 25

DERRICK AND SPUD-  
DING PULLEY  
Fig. 2242



SAND PUMP  
PULLEY  
Fig. 2244



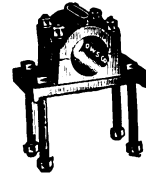
SAND PUMP  
PULLEY  
Fig. 2240



For wire line

JACK POST BOX

Fig. 2256

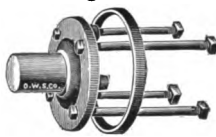


WING  
Fig. 2250



GUDGEONS

BOWL  
Fig. 2254



OUTER JACK POST BEARING  
Fig. 2257



JACK POST STIRRUP  
Fig. 2279



JACK POST EYE BOLT, Fig. 2280



JACK POST HOOK BOLT, Fig. 2281



For prices see page 56

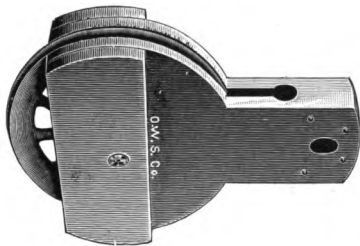


## RIG IRON PARTS

| Size - - - - - inches                                                     | 3½      | Wgt.<br>lbs. | 4       | Wgt.<br>lbs. | 4½      | Wgt.<br>lbs. | 5       | Wgt.<br>lbs. |
|---------------------------------------------------------------------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|
| Rig iron shaft, fig. 2232, complete - - -                                 | \$41 50 | 541          | \$61 00 | 850          | \$70 50 | 943          | \$84 00 | 1089         |
| Shaft only, regular - - - - -                                             | 15 50   | 165          | 20 50   | 220          | 23 75   | 275          | 33 00   | 365          |
| Shaft only, 6 ft. 6 in., for California rig - - -                         | - - -   | - - -        | - - -   | - - -        | 28 00   | 310          | 39 00   | 390          |
| Collar and set screw - - - - -                                            | 85      | 7            | 1 00    | 8            | 1 15    | 11           | 1 25    | 15           |
| Crank only - - - - -                                                      | 8 25    | 140          | 14 50   | 238          | 15 50   | 240          | 17 50   | 250          |
| Wrist pin and nut - - - - -                                               | 4 00    | 19           | 6 50    | 31           | 6 50    | 31           | 6 50    | 35           |
| Wrist pin nut only - - - - -                                              | 85      | - - -        | 1 00    | - - -        | 1 15    | - - -        | 1 15    | - - -        |
| Wrist pin washer - - - - -                                                | 25      | - - -        | 30      | - - -        | 35      | - - -        | 40      | - - -        |
| Pair flanges, complete - - - - -                                          | 13 00   | 210          | 20 50   | 353          | 23 75   | 386          | 26 00   | 422          |
| Flanges only, per pair - - - - -                                          | 12 00   | 198          | 19 50   | 336          | 22 75   | 369          | 25 00   | 405          |
| Flange keys, each - - - - -                                               | 40      | 3            | 40      | 4            | 65      | 4            | 1 00    | 4            |
| Bolts for flanges, per set (8) - - - - -                                  | 1 00    | 9            | 1 00    | 13           | 1 00    | 13           | 1 00    | 13           |
| Stirrur, fig. 2235, complete - - - - -                                    | 5 50    | 67           | 7 50    | 90           | 7 50    | 90           | 7 50    | 90           |
| Stirrur, round iron, fig. 2235, complete,<br>Mannington Pattern - - - - - | - - -   | - - -        | 8 00    | 110          | 8 00    | 110          | 8 00    | 110          |
| Stirrur, Mannington Pattern, 2½ in. Rd. iron - - -                        | - - -   | - - -        | - - -   | - - -        | 13 00   | 140          | 13 00   | 140          |
| Bolts for stirrur, per set (3) - - - - -                                  | 20      | 4            | 25      | 4            | 25      | 4            | 25      | 4            |
| Set center irons, fig. 2236, complete - - - - -                           | 15 00   | 279          | 18 00   | 368          | 18 00   | 368          | 18 00   | 368          |
| Saddle only - - - - -                                                     | 7 50    | 130          | 8 50    | 170          | 8 50    | 170          | 8 50    | 170          |
| Saddle bolts, per set (4) - - - - -                                       | 1 00    | 15           | 1 00    | 15           | 1 00    | 15           | 1 00    | 15           |
| Side irons, per pair - - - - -                                            | 5 50    | 94           | 7 50    | 136          | 7 50    | 136          | 7 50    | 136          |
| Side iron bolts, per set (4) - - - - -                                    | 1 00    | 10           | 1 00    | 10           | 1 00    | 10           | 1 00    | 10           |
| Side iron cap - - - - -                                                   | 1 15    | 14           | 1 50    | 18           | 1 50    | 18           | 1 50    | 18           |
| Side iron cap bolts, per set (2) - - - - -                                | 10      | 2            | 10      | 2            | 10      | 2            | 10      | 2            |
| Set bowl gudgeons, fig. 2254, complete - - - - -                          | - - -   | - - -        | 12 50   | 200          | 12 50   | 200          | 12 50   | 200          |
| Bowl gudgeons only, per pair - - - - -                                    | - - -   | - - -        | 9 00    | 144          | 9 00    | 144          | 9 00    | 144          |
| Bowl gudgeon bands, per pair (2) - - - - -                                | - - -   | - - -        | 1 75    | 20           | 1 75    | 20           | 1 75    | 20           |
| Bowl gudgeon bolts, per set (8) - - - - -                                 | - - -   | - - -        | 1 75    | 36           | 1 75    | 36           | 1 75    | 36           |
| Set wing gudgeons, fig. 2250, complete - - - - -                          | 7 75    | 140          | 9 00    | - - -        | - - -   | - - -        | - - -   | - - -        |
| Wing gudgeons only, per pair - - - - -                                    | 4 75    | 111          | 6 00    | - - -        | - - -   | - - -        | - - -   | - - -        |
| Wing gudgeon bands, per set (4) - - - - -                                 | 3 00    | 29           | 3 00    | 29           | - - -   | - - -        | - - -   | - - -        |
| Sand pump pulley, fig. 2244, 13 inch - - - - -                            | 3 60    | 41           | - - -   | - - -        | - - -   | - - -        | - - -   | - - -        |
| Sand pump pulley, fig. 2244, 14 inch - - - - -                            | 4 50    | 48           | 4 50    | 48           | - - -   | - - -        | - - -   | - - -        |
| Sand pump pulley for wire line, fig. 2240,<br>24 inch - - - - -           | - - -   | - - -        | 7 25    | 90           | 7 25    | 90           | 7 25    | 90           |
| Derrick pulley, fig. 2242, 18 inch - - - - -                              | 4 75    | 75           | - - -   | - - -        | - - -   | - - -        | - - -   | - - -        |
| Derrick pulley, fig. 2242, 22 inch - - - - -                              | 7 00    | 110          | 7 00    | 110          | - - -   | - - -        | - - -   | - - -        |
| Derrick pulley, fig. 2242, 30 inch - - - - -                              | 14 50   | 280          | 14 50   | 280          | 14 50   | 280          | 14 50   | 280          |
| Spudding pulley, fig. 2242, 36 inch - - - - -                             | 16 00   | 360          | 16 00   | 360          | 16 00   | 360          | 16 00   | 360          |
| Jack post box, fig. 2256, complete - - - - -                              | 6 00    | 77           | 7 00    | 94           | 7 75    | 104          | 9 00    | 116          |
| Jack post box, bottom part only - - - - -                                 | 4 00    | 65           | 4 65    | 82           | 5 25    | 92           | 6 00    | 104          |
| Jack post box, bolts for bottom part (4) - - -                            | 75      | - - -        | 75      | - - -        | 75      | - - -        | 75      | - - -        |
| Jack post box, top part or cap only - - - - -                             | 2 00    | - - -        | 2 35    | - - -        | 2 50    | - - -        | 3 00    | - - -        |
| Jack post box, bolts for cap, per set (4) - - -                           | 50      | - - -        | 50      | - - -        | 50      | - - -        | 50      | - - -        |
| Outer Jack Post Bearing, Fig. 2257 - - - - -                              | - - -   | - - -        | 4 50    | 58           | 6 50    | 65           | 9 00    | 75           |
| Rim for calf wheel, 90 in. dia, fig. 2277 - - -                           | - - -   | - - -        | - - -   | - - -        | 25 00   | 440          | - - -   | - - -        |
| Rim bolts, per set (8) - - - - -                                          | - - -   | - - -        | - - -   | - - -        | 1 00    | 13           | - - -   | - - -        |
| Outer tug wheel, fig. 2278, 48 inches dia. - - -                          | - - -   | - - -        | - - -   | - - -        | 35 00   | 487          | - - -   | - - -        |
| Key for outer tug wheel - - - - -                                         | - - -   | - - -        | - - -   | - - -        | 1 75    | 3            | - - -   | - - -        |
| 1½ in. x 8 ft. Jack post eye bolts, fig. 2280, per<br>set (2) - - - - -   | - - -   | - - -        | - - -   | - - -        | 9 00    | 67           | 9 00    | 67           |
| ¾ in. x 8 ft. Jack post hook rods, fig. 2281,<br>per set (2) - - - - -    | - - -   | - - -        | - - -   | - - -        | 5 75    | 30           | 5 75    | 30           |
| ¾ x 16 inch Jack post eye bolts, per set (2) - - -                        | - - -   | - - -        | - - -   | - - -        | 2 50    | 8            | 2 50    | 8            |
| 1x24 inch Jack post D. E. bolts, per set (2) - - -                        | - - -   | - - -        | - - -   | - - -        | 2 00    | 11           | 2 00    | 11           |
| ¾ in. x 7½ ft. Jack post draw bolts, per set, (2) - - -                   | - - -   | - - -        | - - -   | - - -        | 5 75    | 30           | 5 75    | 30           |
| Jack Post Stirrup, Fig. 2279 - - - - -                                    | - - -   | - - -        | - - -   | - - -        | 9 00    | 38           | 9 00    | 38           |

DETAILED PARTS OF STANDARD RIG

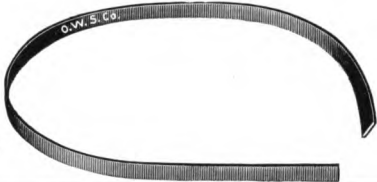
Fig. 2252



HEAVY SAND PULLEY

Wood incased. For  $\frac{3}{8}$  and  $\frac{1}{2}$  inch Wire Rope. Self-lubricating.  
With 24-inch diameter sheave - - - - - \$16 00  
Weight, 162 pounds.

Fig. 2263



BRAKE IRONS  
BRAKE BAND

| Width and thickness - - - - - inches | $\frac{1}{4} \times 5$ | $\frac{1}{4} \times 5$ | $\frac{1}{4} \times 6$ | $\frac{1}{4} \times 7$ | $\frac{1}{4} \times 7$ | $\frac{1}{4} \times 9$ |
|--------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Length - - - - - feet                | 26                     | 28                     | 28                     | 26                     | 28                     | 28                     |
| Weight - - - - - lbs.                | 105                    | 115                    | 142                    | 152                    | 175                    | 213                    |
| Price - - - - -                      | \$5 00                 | 5 50                   | 6 50                   | 7 00                   | 8 00                   | 9 75                   |

BRAKE LEVER AND STAPLE

Fig. 2255

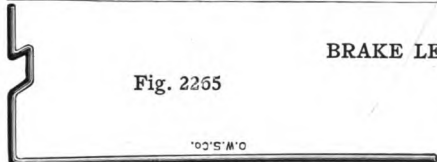


Fig. 2269



| Levers, diameter - - - inches | $1\frac{1}{2}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ | $1\frac{3}{4}$ | $1\frac{3}{4}$ | $1\frac{3}{4}$ | $1\frac{3}{4}$ | 2     |
|-------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|
| Length - - - - - feet         | 9              | 10             | 9              | 9              | 12             | 9              | 12             | 12    |
| Size of band for - - - inches | 5              | 5              | 6              | 7              | 9              | 9              | 9              | 9     |
| Price - - - - -               | \$3 25         | 3 50           | 3 75           | 4 00           | 4 50           | 4 25           | 4 75           | 7 00  |
| Weight - - - - - lbs.         | 60             | 65             | 75             | 75             | 98             | 75             | 98             | 128   |
| Brake staples - - - - - each  | \$0 40         | 40             | 45             | 50             | 50             | 60             | 60             | - - - |
| Weight - - - - - lbs.         | 3              | 3              | 4.5            | 6              | 6              | 8              | 8              | 8     |

BACK BRAKE

Fig. 2267



| Width - - - - - inches     | 8             | 10            | 10            |
|----------------------------|---------------|---------------|---------------|
| Thickness - - - - - inches | $\frac{1}{8}$ | $\frac{3}{8}$ | $\frac{3}{8}$ |
| Length - - - - - feet      | 8             | 8             | 10            |
| Weight - - - - - lbs.      | 22            | 45            | 55            |
| Price - - - - -            | \$1 25        | 2 50          | 3 15          |

DRILLING HOOK

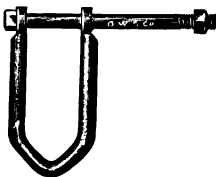
Fig. 2238



Price - - - - - \$3 50  
Weight, 35 pounds.

THREE-POLE DERRICK CLEVIS

Fig. 1253

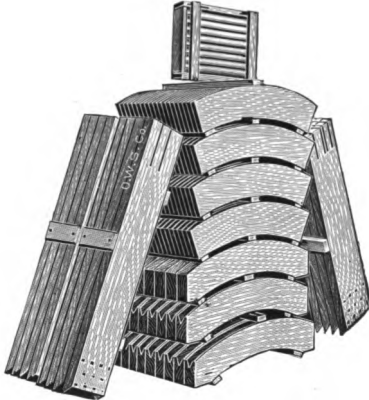


| Diameter iron, inches | 1      | $1\frac{1}{8}$ | $1\frac{1}{4}$ | $1\frac{3}{8}$ | $1\frac{1}{2}$ |
|-----------------------|--------|----------------|----------------|----------------|----------------|
| Weight - - - lbs.     | 20     | 23             | 26             | 34             | 38             |
| Price - - - - -       | \$2 90 | 3 35           | 3 50           | 4 10           | 5 00           |

## WOOD WORK FOR RIG IRON OUTFITS

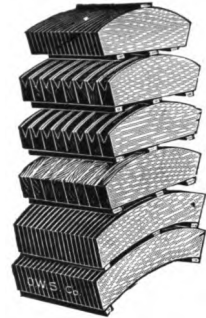
Cants or segments used in building the wheels and arms and handles of bull wheels. Cants, arms and handles are crated for shipment and convenience in handling, and vary in size and number to conform with the requirements of the various outfits as shown herewith.

Fig. 2291



Full set cants, arms and handles for  
bull wheels

Fig. 2297



Full set cants for band and  
tug wheel

### SPECIFICATIONS

#### FOR 3½ INCH REGULAR OUTFIT

|                                                  |                                                                                                                                           | Weight<br>lbs. | Each   | Per set |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------|---------|
| BAND WHEEL,<br>9 feet diameter,<br>8-inch face.  | { 40 1-inch pine cants - - - - -                                                                                                          | 124            | \$0 13 | \$5 20  |
|                                                  |                                                                                                                                           |                |        |         |
| TUG PULLEY<br>on band wheel<br>6½ feet diameter. | { 8 2-inch grooved hemlock cants - - - - -<br>8 2-inch plain hemlock cants - - - - -<br>16 1-inch pine cants - - - - -                    | 55             | \$0 20 |         |
|                                                  |                                                                                                                                           | 55             | 20     |         |
|                                                  |                                                                                                                                           | 50             | 13     | \$5 28  |
|                                                  |                                                                                                                                           | 160            |        |         |
| BULL WHEEL<br>7½ feet diameter.                  | For Tug Side.                                                                                                                             |                |        |         |
|                                                  | { 8 2½-inch grooved hemlock cants - - - - -<br>32 1 inch pine cants - - - - -<br>8 8 inch oak arms - - - - -<br>16 half handles - - - - - | 85             | \$0 32 |         |
|                                                  |                                                                                                                                           | 98             | 17     |         |
|                                                  |                                                                                                                                           | 165            | 36     |         |
|                                                  |                                                                                                                                           | 10             | 02½    |         |
|                                                  | For Brake Side.                                                                                                                           |                |        |         |
|                                                  | { 8 2½-inch plain hemlock cants - - - - -<br>40 1-inch pine cants - - - - -<br>8 8-inch oak arms - - - - -<br>16 half handles - - - - -   | 85             | \$0 30 |         |
|                                                  |                                                                                                                                           | 122            | 17     |         |
|                                                  |                                                                                                                                           | 165            | 36     |         |
|                                                  |                                                                                                                                           | 10             | 02½    | \$23 76 |
|                                                  |                                                                                                                                           | 740            |        |         |

Band wheel, tug pulley, and bull wheel cants, arms and handles, complete as above - \$34 24

## WOOD WORK FOR RIG IRON OUTFITS

## SPECIFICATIONS

## FOR OHIO AND INDIANA OIL FIELDS

|                                                          |                                          | Weight<br>lbs. | Each   | Per Set |
|----------------------------------------------------------|------------------------------------------|----------------|--------|---------|
| BAND WHEEL,<br>9 feet diameter,<br>8 inch face.          | 40 1-inch pine cants - - - - -           | 125            | \$0 13 | \$5 20  |
| TUG PULLEY<br>on band wheel,<br>6½ feet diameter.        | 16 1x8-inch pine cants - - - - -         | 50             | 13     |         |
|                                                          | 8 2x8-inch grooved hemlock cants - - -   | 55             | 20     |         |
|                                                          | 8 2x8-inch plain hemlock cants - - - -   | 55             | 20     | 5 28    |
|                                                          |                                          | 160            |        |         |
|                                                          | For Tug Side.                            |                |        |         |
|                                                          | 16 1½x5-inch pine cants - - - - -        | 68             | 18     |         |
|                                                          | 8 2x5-inch grooved hemlock cants - - -   | 55             | 20     |         |
|                                                          | 8 8-inch oak arms, tapered and bored - - | 165            | 40     |         |
|                                                          | 16 half handles - - - - -                | 10             | 02½    |         |
|                                                          | For Brake Side.                          |                |        |         |
|                                                          | 24 1x5-inch pine cants - - - - -         | 75             | 13     |         |
|                                                          | 8 2x5-inch plain hemlock cants - - - -   | 55             | 20     |         |
|                                                          | 8 8-inch oak arms, tapered and bored - - | 165            | 40     |         |
|                                                          | 16 half handles - - - - -                | 10             | 02½    | 16 40   |
|                                                          |                                          | 603            |        |         |
| Complete set cants, arms and handles, as above - - - - - |                                          |                |        | \$26 88 |

## FOR 4 AND 4½-INCH REGULAR OUTFIT

|                                                                                              |                                        | Weight<br>lbs. | Each   | Per Set |
|----------------------------------------------------------------------------------------------|----------------------------------------|----------------|--------|---------|
| BAND WHEEL,<br>10 feet diameter,<br>10-inch face.                                            | 40 1-inch pine cants - - - - -         | 170            | \$0 19 | \$7 60  |
| TUG PULLEY<br>on band wheel,<br>7 feet diameter.                                             | 8 2½ inch grooved hemlock cants - - -  | 65             | 26     |         |
|                                                                                              | 8 2½-inch plain hemlock cants - - - -  | 82             | 24     |         |
|                                                                                              | 16 1 -inch pine cants - - - - -        | 45             | 15     | 6 40    |
|                                                                                              |                                        | 192            |        |         |
|                                                                                              | For Tug Side.                          |                |        |         |
|                                                                                              | 8 2½-inch grooved hemlock cants - - -  | 85             | 32     |         |
|                                                                                              | 32 1 -inch pine cants - - - - -        | 98             | 17     |         |
|                                                                                              | 8 8 -inch oak arms, straight - - - - - | 165            | 36     |         |
|                                                                                              | 16 half handles - - - - -              | 10             | 02½    |         |
|                                                                                              | For Brake Side.                        |                |        |         |
|                                                                                              | 8 2½-inch plain hemlock cants - - - -  | 97             | 30     |         |
|                                                                                              | 40 1 -inch pine cants - - - - -        | 116            | 17     |         |
|                                                                                              | 8 8 -inch oak arms, straight - - - - - | 165            | 36     |         |
|                                                                                              | 16 half handles - - - - -              | 10             | 02½    | 23 76   |
|                                                                                              |                                        | 746            |        |         |
| Band wheel, tug pulley and bull wheel cants, arms and handles, complete, as above, - - - - - |                                        |                |        | \$37 76 |

FOR 4½-INCH REGULAR OUTFIT WITH DOUBLE TUG AND  
7-INCH BRAKE IRONS

|                                                         |                                        | Weight<br>lbs. | Each   | Per Set |
|---------------------------------------------------------|----------------------------------------|----------------|--------|---------|
| BAND WHEEL,<br>10 feet diameter,<br>10 or 12 inch face. | 40 1-inch pine cants - - - - -         | 170            | \$0 19 | \$7 60  |
| TUG PULLEY<br>on band wheel,<br>7 feet diameter.        | 16 2½-inch grooved hemlock cants - - - | 137            | 26     |         |
|                                                         | 8 2½-inch plain hemlock cants - - - -  | 82             | 24     |         |
|                                                         | 24 1 -inch pine cants - - - - -        | 75             | 15     | 9 68    |
|                                                         |                                        | 294            |        |         |

## WOOD WORK FOR RIG IRON OUTFITS

### SPECIFICATIONS

#### FOR 4½-INCH REGULAR OUTFIT WITH DOUBLE TUG AND 7-INCH BRAKE IRONS CONTINUED

|                                   | For Tug Side.                      | Weight, lbs. | Each   | Per Set |
|-----------------------------------|------------------------------------|--------------|--------|---------|
| BULL WHEELS,<br>7½ feet diameter. | 16 2½ inch grooved hemlock cants - | 170          | \$0 32 |         |
|                                   | 40 1 -inch pine cants - - - - -    | 116          | 17     |         |
|                                   | 8 10 -inch oak arms - - - - -      | 185          | 42     |         |
|                                   | 16 half handles - - - - -          | 10           | 02½    |         |
|                                   | For Brake Side.                    |              |        |         |
|                                   | 8 2½-inch plain hemlock cants - -  | 97           | 30     |         |
|                                   | 40 1 -inch pine cants - - - - -    | 116          | 17     |         |
|                                   | 8 8 -inch oak arms - - - - -       | 165          | 36     |         |
|                                   | 16 half handles - - - - -          | 10           | 02½    | \$28 16 |
|                                   |                                    | 869          |        |         |

Band wheel, tug pulley and bull wheel cants, arms and handles,  
complete as above - - - - - \$45 44

NOTE—Where 9 inch brake irons are used, substitute 8 10-inch  
oak arms instead of 8-inch, on brake side of bull wheel, and  
add 16 1-inch pine cants. Add - - - - - 3 20

#### FOR 4½-INCH MANNINGTON SPECIAL OUTFIT, WITH DOUBLE TUG AND 9-INCH BRAKE IRONS

|                                                   | Weight, lbs.                       | Each | Per Set |
|---------------------------------------------------|------------------------------------|------|---------|
| BAND WHEEL,<br>10 feet diameter,<br>12 inch face. | 40 1-inch pine cants - - - - -     | 170  | \$0 19  |
| TUG PULLEY<br>on band wheel<br>7 feet diameter.   | 16 2½-inch grooved hemlock cants - | 137  | 26      |
|                                                   | 8 2½-inch plain hemlock cants - -  | 82   | 24      |
|                                                   | 24 1 -inch pine cants - - - - -    | 75   | 15      |
|                                                   |                                    | 294  | 9 68    |

|                                   |                                    |     |     |       |
|-----------------------------------|------------------------------------|-----|-----|-------|
| BULL WHEELS,<br>7½ feet diameter. | For Tug Side.                      |     |     |       |
|                                   | 16 2½-inch grooved hemlock cants - | 175 | 32  |       |
|                                   | 40 1 -inch pine cants - - - - -    | 116 | 17  |       |
|                                   | 8 10 -inch oak arms - - - - -      | 185 | 42  |       |
|                                   | 16 half handles - - - - -          | 10  | 02½ |       |
|                                   | For Brake Side.                    |     |     |       |
|                                   | 8 2½-inch plain hemlock cants - -  | 97  | 30  |       |
|                                   | 56 1 -inch pine cants - - - - -    | 166 | 17  |       |
|                                   | 8 10 -inch oak arms - - - - -      | 165 | 42  |       |
|                                   | 16 half handles - - - - -          | 10  | 02½ | 31 36 |
|                                   |                                    | 924 |     |       |

Complete set cants, arms and handles, as above - - - - - \$48 64

|                                  |                                    |     |     |       |
|----------------------------------|------------------------------------|-----|-----|-------|
| BULL WHEELS,<br>8 feet diameter. | For Tug Side.                      |     |     |       |
|                                  | 16 2½ inch grooved hemlock cants - | 160 | 34  |       |
|                                  | 40 1 -inch pine cants - - - - -    | 116 | 18  |       |
|                                  | 8 10 -inch oak arms - - - - -      | 190 | 44  |       |
|                                  | 16 half handles - - - - -          | 10  | 02½ |       |
|                                  | For Brake Side.                    |     |     |       |
|                                  | 8 2½-inch plain hemlock cants - -  | 100 | 32  |       |
|                                  | 56 1 -inch pine cants - - - - -    | 170 | 18  |       |
|                                  | 8 10 -inch oak arms - - - - -      | 190 | 44  |       |
|                                  | 16 half handles - - - - -          | 10  | 02½ | 33 12 |
|                                  |                                    | 946 |     |       |

Complete set cants, arms and handles for 4½-inch double tug  
outfit, with 9-inch brake irons and 8-foot bull wheels - - - - - \$50 40

# WOOD WORK FOR RIG IRON OUTFITS

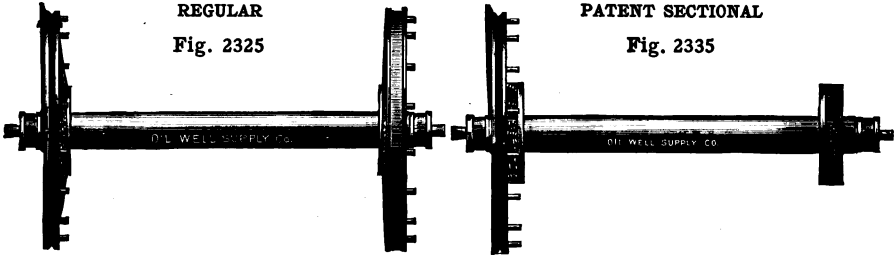
## BULL WHEELS

REGULAR

Fig. 2325

PATENT SECTIONAL

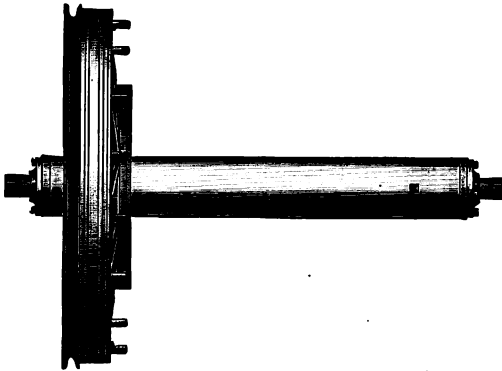
Fig. 2335



(Brake end not completed)

Fig. 2339

## EXTRA BULL WHEEL OR CALF WHEEL



For position of calf wheel in rig, see page 16. One end of the shaft is built up to act as both tug and brake. This leaves free space for driller to stand while operating the engine.

It will be noted from the weights and measurements of bull wheels that they are too large for convenient handling and transportation. For that reason it is customary to ship them "knocked down."

The following list covers price of all parts of the bull wheels prepared for putting together at destination.

For sketch showing construction, see page 63.

|                                          | Weight,<br>lbs. | Price   |
|------------------------------------------|-----------------|---------|
| 7½ ft. Bull Wheels, single tug - - - - - | 1,700           | \$50 00 |
| 7½ ft. Bull Wheels, double tug - - - - - | 1,825           | 56 00   |
| 8 ft. Bull Wheels, double tug - - - - -  | 1,900           | 58 00   |
| 7½ ft. Bull Wheels, sectional - - - - -  | -----           | 65 00   |
| Calf Wheel, Fig. 2339 - - - - -          | 1,725           | 64 00   |

## BULL WHEEL SHAFTS

WITH WING GUDGEONS

Fig. 2329

## BULL WHEEL SHAFTS

WITH BOWL GUDGEONS

Fig. 2331



|                                                                 | Price,<br>plain | Weight,<br>plain | Price,<br>ironed | Weight,<br>ironed |
|-----------------------------------------------------------------|-----------------|------------------|------------------|-------------------|
| Shaft for 3½ in. irons, 12 inches diameter, wing gudgeons - -   | \$11 00         | 800              | \$19 00          | 940               |
| Shaft for 4 in. irons, 12 inches diameter, bowl gudgeons - -    | 13 00           | 800              | 21 00            | 940               |
| Shaft for 4½ and 5 in. irons, 16 inches diameter, bowl gudgeons | 17 00           | 1,000            | 26 00            | 1,144             |

For detailed price of other parts of Bull Wheels see: Gudgeons, page 56; Cants, Arms and Handles, pages 58 to 60; Calf Wheel Iron Rim, page 56.

WOOD WORK FOR RIG IRON OUTFITS  
SECTIONAL BAND WHEELS AND TUG PULLEYS

Fig. 2320

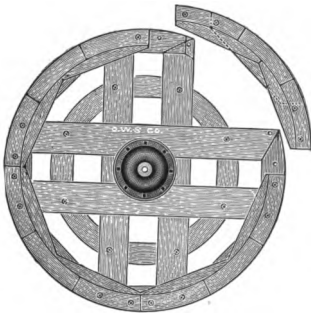
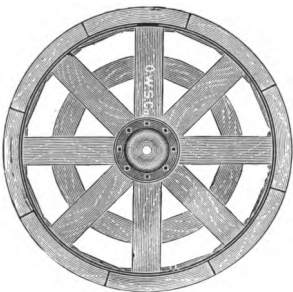


Fig. 2322



Fig. 2315



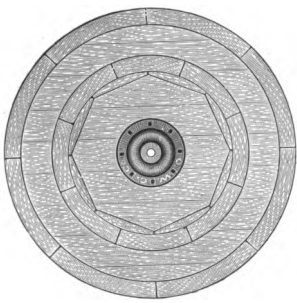
Section

FIG. 2320

|                                                       |           |         |
|-------------------------------------------------------|-----------|---------|
| 9 feet diameter, 8-inch face, made up, less flanges   | - - - - - | \$50 00 |
| 9 feet diameter, 10-inch face, made up, less flanges  | - - - - - | 56 00   |
| 9 feet diameter, 12-inch face, made up, less flanges  | - - - - - | 60 00   |
| 10 feet diameter, 10-inch face, made up, less flanges | - - - - - | 61 00   |
| 10 feet diameter, 12-inch face, made up, less flanges | - - - - - | 66 00   |

COMMON BAND WHEEL AND TUG PULLEY

TUG SIDE  
Fig. 2310



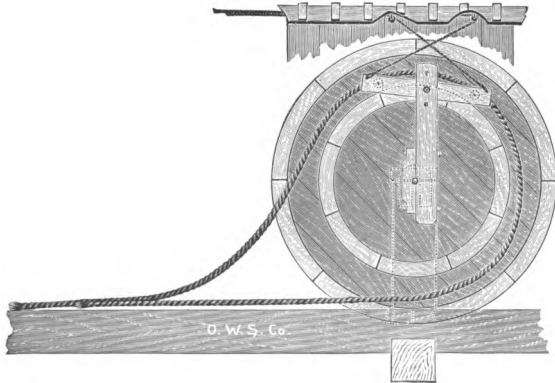
FACE  
Fig. 2311



Figs. 2310 and 2311 show the standard band and tug wheels as they are made in the field. For detail of construction, see page 63. Fig. 2311 shows single tug only. When double tug is used the cants are built up on the outside of the first or single tug, thus making two grooves for the bull ropes or transmission. These standard band and tug wheels are the best for deep well work and should be built in the field, as a "made-up" wheel is too large and heavy for convenient shipment.

BULL ROPE PROTECTOR (IN USE) AND PARTS

Fig. 2351

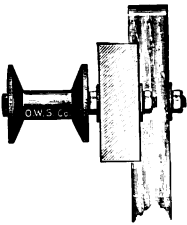


JACK POST SLEEVE  
Fig. 2352



Showing section of the shaft passing through it.

OUTER END OF PROTECTOR  
Fig. 2353

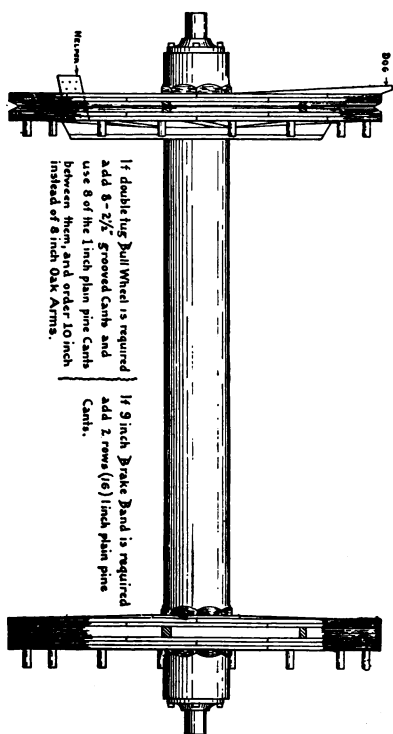
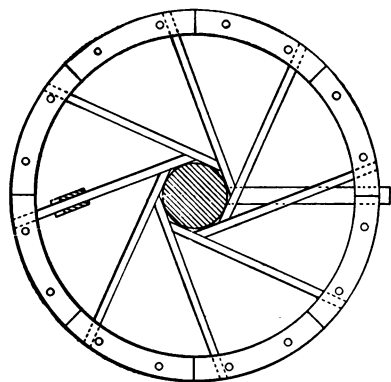


Showing spool attached

Prices quoted on application.

## WOOD WORK FOR RIG IRON OUTFITS

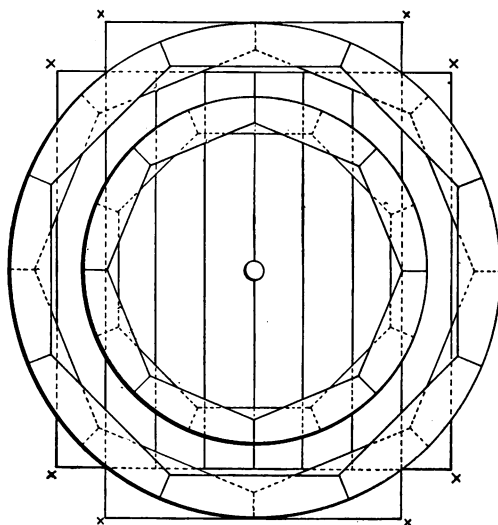
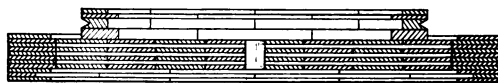
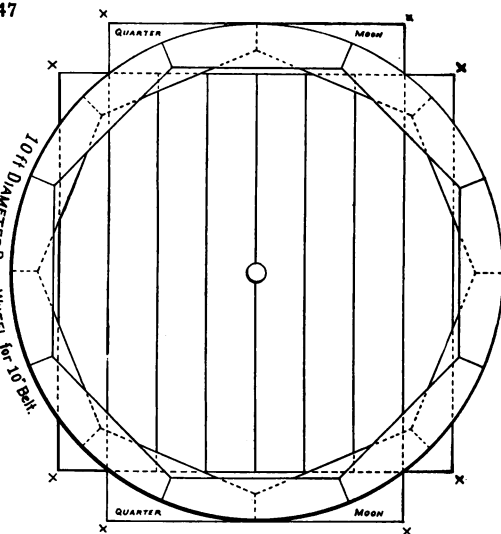
Fig. 2347



**WOOD REQUIRED FOR 7½ ft. REGULAR BULL WHEELS.**  
 1 Shaft, 8-2½" grooved Cants, 32-1 inch plain pine Cants, 8-8" Oak Arms, 16 Handles for Tug end and 8-2½" plain Cants, 40-1" plain pine Cants, 8-8" straight Oak Arms, 16 Handles for Brake end, 1 piece 2x4x12" Oak for Doo and to nail to tug arms for protection of handles.

Saw corners X off as close to Cants as possible and smooth with Drawing Knife or Stick.

If double tug is required on Band Wheel, add one row (8) 2½" grooved Cant and one row 1 inch plain pine Tug Cants. If 12 Belt is to be used, add 4-1x12x16 boards, 4 quarter moons and 8-1 plain pine Cants.



**WOOD REQUIRED FOR 10 ft. diam. BANDWHEEL for 10" BELT.**  
 28 pieces 1x12x16 (56 pieces 1x12x8) for Center.  
 14 " 1x12x12 for 28 quarter Moons, 32-1" plain pine Band Cants, 8-2½" plain Tug Cants, 8-2½" grooved Tug Cants, 16-1" plain pine Tug Cants.

Diagrams showing the construction and manner of "building up" band, tug, and bull wheels. For specification of parts, see pages 58 to 60



WOODEN SAND REELS

MADE WITH EITHER WING OR BOWL GUDGEONS

STANDARD WITH WING GUDGEONS

Fig. 2368



SHORT NOSE WITH WING GUDGEONS

Fig. 2360



STANDARD WITH BOWL GUDGEONS

Fig. 2362



STANDARD WITH END LAGGINGS

Fig. 2383



STANDARD WITH WIRED LAGGINGS

Fig. 2366



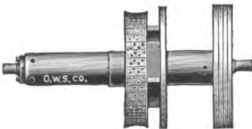
EATON'S PATENT

Fig. 2370



|                                         | Price   | Weight | Price   | Weight | Price   | Weight |
|-----------------------------------------|---------|--------|---------|--------|---------|--------|
| Size - - - - - inches                   | 36      | 36     | 40      | 40     | 44      | 44     |
| Fig. 2368 with oak shaft - - - - -      | \$19 00 | 650    |         |        |         |        |
| Fig. 2362 with oak shaft - - - - -      | 21 00   | 700    | \$24 50 | 800    |         |        |
| Fig. 2362 with oak shaft and oak head - | 22 50   | 750    | 26 00   | 1,030  | \$30 00 |        |
| Fig. 2383 with oak shaft - - - - -      |         |        | 28 50   | 950    | 33 00   |        |
| Fig. 2366 with wired laggings - - - -   | 20 00   | 650    | 26 50   | 800    | 35 00   |        |
| Fig. 2370 with oak shaft - - - - -      | 25 00   |        | 27 00   |        |         |        |
| Laggings per set (side) - - - - -       | 2 75    |        | 3 75    |        | 3 75    |        |
| Add for bands shrunk on nose end -      |         |        | 1 75    |        | 2 00    |        |

Fig. 2374



Weight lbs.

PATENT STRAIGHT LINE

|                            |         |
|----------------------------|---------|
| 36-inch - - - - -          | \$30.00 |
| Laggings per set - - - - - | 5.00    |

The weight of the line draws the reel straight against the band wheel, thus securing smoothness and rapidity of motion.

## SAND REEL GUDGEONS

Fig. 2403 CUP



Taper pin

Fig. 2404



Straight pin

Fig. 2401 BOWL



Straight pin

Fig. 2400

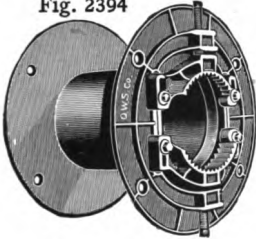


Taper pin

| Size reel for - - - inches  | 36     | 40     | Size reel for - - - inches   | 36     | 40     |
|-----------------------------|--------|--------|------------------------------|--------|--------|
| Per set (2) - - - - -       | \$4 50 | \$5 50 | Per set (2) less bands - - - | \$5 00 | \$6 00 |
| Weight - - - - - lbs.       | 51     | 72     | Weight, - - - - - lbs.       | 66     | 72     |
| Wing gudgeons - - - per set | - - -  | - - -  | Bands - - - - - each         | 50     | - - -  |
| Bands - - - - - each        | - - -  | - - -  | Weight, each - - - lbs.      | 5      | - - -  |

## MALLEABLE IRON SPOOL

Fig. 2394

For wire sand line  
Weight 266 lbs.

|                           |         |    |    |    |    |    |
|---------------------------|---------|----|----|----|----|----|
| Size shaft for - in.      | 10      | 10 | 10 | 12 | 12 | 12 |
| Size drum - - in.         | 14      | 16 | 20 | 14 | 16 | 20 |
| All sizes, each - - - - - | \$27 00 |    |    |    |    |    |

## FURMAN PATENT ADJUSTABLE SAND REEL CONNECTION

Fig. 2410



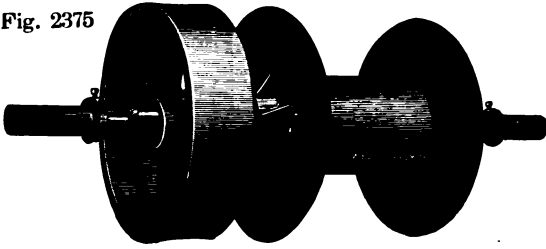
This secures the proper adjustment between the band wheel and the sand reel pulley. As the pulley wears smaller the adjustment is changed so that the pulley is kept at its proper point of contact with the band wheel. Price, \$10.00.

IRON SAND REELS  
OKLAHOMA REEL

Fig. 2391

|                                                | Weight, lbs. | Price.   |
|------------------------------------------------|--------------|----------|
| Complete - - - - -                             | 1226         | \$ 80 00 |
| Pulley only - - - - -                          | 390          | 28 00    |
| Flanges, per set (2) - - - - -                 | 400          | 25 00    |
| Drum only - - - - -                            | 102          | 6 00     |
| Collars, per set (2) - - - - -                 | 14           | 2 00     |
| Shaft, 4 inch x 7 feet, 1 1/4 inches - - - - - | 300          | 20 00    |
| Double end bolts, per set (6) - - - - -        | 16           | 1 50     |
| Key, 3/8 x 8 inch - - - - -                    | 2            | 1 25     |
| Keys, 3/8 x 6 inch, per set (2) - - - - -      | 3            | 1 50     |

Fig. 2375

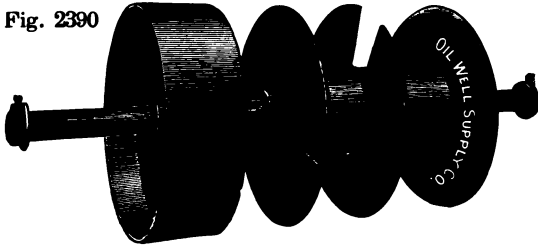


## IRON SAND REELS

California Single Drum Iron Sand Reels are made both with cast iron flanges and pressed steel flanges. If there is a preference for either, the order must so indicate, otherwise orders may be filled with either cast iron or steel flanges.

|                                                      | Weight,<br>lbs. | Price.  |
|------------------------------------------------------|-----------------|---------|
| Complete with 34 x 10 inch open arm pulley - - - - - | 1372            | \$93 00 |
| Complete with 34 x 10 inch web pulley - - - - -      | 1415            | 96 00   |
| Complete with 38 x 12 inch open arm pulley - - - - - | 1400            | 98 00   |
| Complete with 38 x 12 inch web pulley - - - - -      | 1445            | 100 00  |
| Pulley only, 34 x 10 inch, open arm - - - - -        | 425             | 30 00   |
| Pulley only, 34 x 10 inch, web - - - - -             | 468             | 35 00   |
| Pulley only, 38 x 12 inch, open arm - - - - -        | 496             | 36 00   |
| Pulley only, 38 x 12 inch, web - - - - -             | 540             | 39 00   |
| Flanges, per set (2) - - - - -                       | 326             | 27 00   |
| Drum only - - - - -                                  | 238             | 13 50   |
| Collars, per set (2) - - - - -                       | 18              | 2 00    |
| Shaft, 4 inch x 8 feet - - - - -                     | 345             | 22 50   |
| D. E. Bolts, per set (3) - - - - -                   | 16              | 1 00    |
| Key, $\frac{7}{8}$ x 8 inch - - - - -                | 2               | 1 25    |
| Keys, $\frac{7}{8}$ x 6 inch, per set (2) - - - - -  | 3               | 1 75    |

Fig. 2390



California Double Drum Iron Sand Reels are made in different sizes and with either cast iron or pressed steel flanges. If there is a preference for either style of flange the order must so indicate, otherwise no distinction will be considered.

| With 36 inch Diameter Flanges.                  | Weight,<br>lbs. | Price.   | With 40 inch Diameter Flanges.<br>(Pressed Steel Only.) | Weight,<br>lbs. | Price.   |
|-------------------------------------------------|-----------------|----------|---------------------------------------------------------|-----------------|----------|
| Complete with 34 inch Open Arm Pulley - - - - - | 1545            | \$105 00 | Complete with 42 inch Open Arm Pulley - - - - -         | 1810            | \$130 00 |
| Complete with 34 inch Web Pulley - - - - -      | 1583            | 110 00   | Complete with 42 inch Web Pulley - - - - -              | 1900            | 135 00   |

| PARTS.                                              | 36 INCH REEL    |         | 40 INCH REEL    |         |
|-----------------------------------------------------|-----------------|---------|-----------------|---------|
|                                                     | Weight,<br>lbs. | Price.  | Weight,<br>lbs. | Price.  |
| Open arm pulley only - - - - -                      | 471             | \$32 00 | 700             | \$50 00 |
| Web pulley only - - - - -                           | 509             | 37 00   | 790             | 56 00   |
| Outside flanges, per set (2) - - - - -              | 396             | 24 00   | 348             | 30 00   |
| Center flange - - - - -                             | 167             | 10 00   | 256             | 20 00   |
| Long drum - - - - -                                 | 101             | 6 00    | 45              | 2 50    |
| Short drum - - - - -                                | 75              | 5 00    | 45              | 2 50    |
| Double end bolts, per set (3) - - - - -             | 13              | 1 00    | 18              | 1 50    |
| Shaft, 4 inch - - - - -                             | 342             | 24 00   | 385             | 27 00   |
| Collars, per set (2) - - - - -                      | 13              | 2 00    | 13              | 2 00    |
| Key, $\frac{7}{8}$ x 8 inch - - - - -               | 2               | 1 00    | 2               | 1 00    |
| Keys, $\frac{7}{8}$ x 6 inch, per set (2) - - - - - | 3               | 1 50    | 3               | 1 50    |

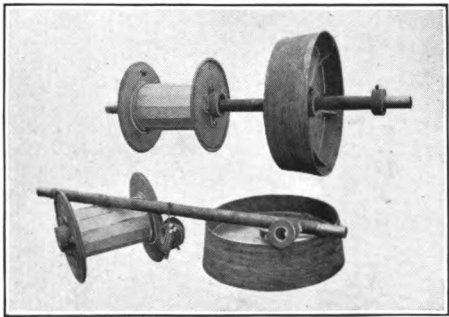
IRON SAND REELS

KANSAS REEL

Fig. 2386



|                                      | Weight,<br>lbs. | Price   |
|--------------------------------------|-----------------|---------|
| Complete - - - - -                   | 1,026           | \$70 00 |
| Pulley only - - - - -                | 447             | 32 00   |
| Flanges - - - - - per set (2)        | 316             | 20 00   |
| Collars - - - - - per set (2)        | 11              | 1 50    |
| Shaft, 3 in. x 8 ft. 5 in. - - - - - | 200             | 12 00   |
| Drum only - - - - -                  | 48              | 4 00    |
| Keys - - - - - per set (3)           | 4               | 2 00    |



The Knupp Iron Sand Reel, Fig. 2389. Showing the reel ready for use and K. D. ready to ship. This reel is furnished with all Knupp Rigs, see Fig. 1278. page 29 and can be used with our Standard Rigs. Weight 1150 lbs. Price \$65 00.

Fig. 2387



IRON SHAFT SAND REEL

Friction, brake pulley and flanges detachable. The friction pulley is built up of wooden segments secured between metal flanges.

SAND REEL BRAKE LEVER AND REACH STRAP

Fig. 2377

FOR USE WITH IRON SAND REELS  
WEIGHT 75 LBS.



|                              |        |
|------------------------------|--------|
| Levers, each - - - - -       | \$5 00 |
| Reach straps, each - - - - - | 1 50   |

## SPECIFICATION FOR 3½-INCH REGULAR RIG IRON OUTFIT

|                                            | Weight,<br>lbs. |                                                    | Weight,<br>lbs. |
|--------------------------------------------|-----------------|----------------------------------------------------|-----------------|
| 1 shaft, crank, collar and wrist pin - - - | 330             | 8 D. E. bolts, ¾x18 inches - - -                   |                 |
| 1 pair flanges with keys and bolts - - -   | 210             | Machine bolts, 1 ½x6 in., 2 ¾x10 in., 10           |                 |
| 1 set center-irons complete - - -          | 279             | ¾x14 or 16 in., 1 ¾x18 in., 2 ¾x22                 |                 |
| 1 stirrup with bolts - - -                 | 65              | in., 1 1x20 in. - - -                              | 105             |
| 2 wing gudgeons with 4 bands - - -         | 140             | 24 ¾ and 8 ¾ in. cast-iron washers - - -           |                 |
| 1 derrick or crown pulley, 18-inch - - -   | 75              | 24 ¾-in. wrought-iron washers - - -                |                 |
| 1 sand pump pulley, 13-inch - - -          | 41              | Nails, 150 lbs. 10d, 50 lbs. 20d, 125 lbs. 30d. -  | 325             |
| 1 brake band, ¾ x 5 inches x 26 feet - - - | 105             | 1 36-in. standard oak shaft sand reel - - -        | 650             |
| 1 brake lever, 1 ½ inches x 9 feet - - -   | 60              | 1 set 7½-ft. bull wheel cants, arms and handles, - | 740             |
| 1 brake staple, 5-inch - - -               | 3               | 1 set 9-ft. band wheel cants - - -                 |                 |
| 1 back brake, 8 inches x 8 feet - - -      | 22              | 1 set 6½-ft. tug pulley cants - - -                | 284             |

For number and sizes of cants, see page 58.

## SPECIFICATION FOR NORTHERN OHIO AND INDIANA RIG IRON OUTFIT

|                                                  | Weight,<br>lbs. |                                                    | Weight,<br>lbs. |
|--------------------------------------------------|-----------------|----------------------------------------------------|-----------------|
| 1 4-in. shaft, crank, collar and wrist pin - - - | 497             | 8 D. E. bolts, ¾x16 in. - - -                      |                 |
| 1 pair 4-in. flanges with keys and bolts - - -   | 353             | Machine bolts, 4 ¾x18 in., 8 ¾x16 in., 2           |                 |
| 1 set 3½-in. center irons complete - - -         | 279             | ¾x14 in., 2 ¾x12 in., 2 ¾x10 in., 5                |                 |
| 1 3½-in. stirrup with bolts - - -                | 65              | ¾x8 in. - - -                                      | 100             |
| 2 3½-in. wing gudgeons with 4 bands - - -        | 140             | 26 ¾-in. cast-iron washers - - -                   |                 |
| 1 derrick or crown pulley, 18 in - - -           | 75              | 26 ¾-in. wrought-iron washers - - -                |                 |
| 1 sand pump pulley, 13 in. - - -                 | 41              | Nails, 100 lbs. 10d, 100 lbs. 20d, 100 lbs. 30d. - | 300             |
| 1 brake band, ¾ in. x 5 in. x 26 ft. - - -       | 105             | 1 36-in. standard oak shaft sand reel - - -        | 650             |
| 1 brake lever, 1 ½ in. x 9 ft. - - -             | 60              | 1 set 7½-ft. bull wheel cants, arms and handles, - | 603             |
| 1 brake staple, 5 in. - - -                      | 3               | 1 set 9-ft. band wheel cants - - -                 |                 |
| 1 back brake, 8 in. x 8 ft. - - -                | 22              | 1 set 6½-ft. tug pulley cants - - -                | 285             |

For number and sizes of cants, see page 59.

## SPECIFICATION FOR 4-INCH REGULAR RIG IRON OUTFIT

|                                                | Weight,<br>lbs. |                                                    | Weight,<br>lbs. |
|------------------------------------------------|-----------------|----------------------------------------------------|-----------------|
| 1 shaft, crank, collar and wrist pin - - -     | 497             | 8 D. E. bolts, ¾x18 in. - - -                      |                 |
| 1 pair flanges with keys and bolts - - -       | 353             | Machine bolts, 2 ¾x22 in., 1 ¾x18 in.,             |                 |
| 1 set center irons complete - - -              | 368             | 10 ¾x14 or 16 in., 2 ¾x10 in., 1 ¾x6               |                 |
| 1 stirrup with bolts - - -                     | 84              | in., 1 1x20 in. - - -                              | 105             |
| 2 bowl gudgeons with 2 bands and 8 bolts - - - | 200             | 24 ¾-in. and 8 ¾-in. cast-iron washers - - -       |                 |
| 1 derrick or crown pulley, 30 in. - - -        | 280             | 24 ¾-in. wrought-iron washers - - -                |                 |
| 1 sand pump pulley for wire line, 24 in. - - - | 90              | Nails, 175 lbs. 10d, 75 lbs. 20d, 150 lbs. 30d. -  | 400             |
| 1 brake band, ¾ in. x 7 in. x 26 ft. - - -     | 152             | 1 40-in. standard oak shaft sand reel - - -        | 950             |
| 1 brake lever, 1 ¾ in. x 9 ft. - - -           | 75              | 1 set 7½-ft. bull wheel cants, arms and handles, - | 746             |
| 1 brake staple, 7 in. - - -                    | 6               | 1 set 10-ft. band wheel cants - - -                |                 |
| 1 back brake, 10 in. x 8 ft. - - -             | 45              | 1 set 7-ft. tug pulley cants - - -                 | 362             |

For number and size of cants, see page 59.

## SPECIFICATION FOR 4½-INCH REGULAR RIG IRON OUTFIT

|                                                 | Weight,<br>lbs. |                                                    | Weight,<br>lbs. |
|-------------------------------------------------|-----------------|----------------------------------------------------|-----------------|
| 1 shaft, crank, collar and wrist pin - - -      | 552             | 8 D. E. bolts, ¾x18 in. - - -                      |                 |
| 1 pair flanges with keys and bolts - - -        | 386             | Machine bolts, 1 ½x6 in., 2 ¾x10 in., 10           |                 |
| 1 set center irons complete - - -               | 368             | ¾x14 in. or 16 in., 1 ¾x18 in., 2 ¾x22             |                 |
| 1 stirrup with bolts - - -                      | 84              | in., 1 1x20 in. - - -                              | 105             |
| 2 bowl gudgeons with 2 bands and 8 bolts - - -  | 200             | 24-¾ in. and 8 ¾-in. cast-iron washers - - -       |                 |
| 1 derrick or crown pulley, 30 inch - - -        | 280             | 24-¾ in. wrought-iron washers - - -                |                 |
| 1 sand pump pulley for wire line, 24 inch - - - | 90              | Nails, 175 lbs. 10d, 75 lbs. 20d, 150 lbs. 30d. -  | 400             |
| 1 brake band, ¾ in. x 7 in. x 26 ft. - - -      | 152             | 1 40-in. standard oak shaft sand reel - - -        | 950             |
| 1 brake lever, 1 ¾ in. x 9 ft. - - -            | 75              | 1 set 7½-ft. bull wheel cants, arms and handles, - | 746             |
| 1 brake staple, 7 in. - - -                     | 6               | 1 set 10-ft. band wheel cants - - -                |                 |
| 1 back brake, 10 in. x 8 ft. - - -              | 45              | 1 set 7½-ft. tug pulley cants - - -                | 362             |

For number and sizes of cants, see page 59.

## SPECIFICATION FOR 4½-INCH DOUBLE TUG RIG IRON OUTFIT

|                                                | Weight,<br>lbs. |                                                    | Weight,<br>lbs. |
|------------------------------------------------|-----------------|----------------------------------------------------|-----------------|
| 1 shaft, crank, collar and wrist pin - - -     | 552             | 8 D. E. bolts, ¾x18 in. - - -                      |                 |
| 1 pair flanges with keys and bolts - - -       | 386             | Machine bolts, 12 ¾x20 in., 10 ¾x18 in.,           |                 |
| 1 set center irons complete - - -              | 368             | 2 ¾x16 in., 2 ¾x14 in., 20 ¾x12 in.,               |                 |
| 1 stirrup with bolts - - -                     | 84              | 4 ¾x10 in., 4 ¾x8 in., 10 ¾x18 in. -               | 200             |
| 2 bowl gudgeons with 2 bands and 8 bolts - - - | 200             | 32 ¾-in. and 8 ¾-in. cast-iron washers - - -       |                 |
| 1 derrick or crown pulley, 30-inch - - -       | 280             | 40 ¾-inch wrought-iron washers - - -               |                 |
| 1 sand pump pulley for wire line, 24 in. - - - | 90              | Nails, 150 lbs. 10d, 100 lbs. 20d, 200 lbs. 30d. - | 450             |
| 1 brake band, ¾ in. x 7 in. x 28 ft. - - -     | 175             | 1 40-in. standard oak head and oak shaft sand      |                 |
| 1 brake lever, 1 ¾ in. x 9 ft. - - -           | 75              | reel - - -                                         | 1,030           |
| 1 brake staple, 7-in. - - -                    | 6               | 1 set 7½-ft. bull wheel cants, arms and handles, - | 869             |
| 1 back brake, 10-in. x 8 ft. - - -             | 45              | 1 set 10-ft. band wheel cants - - -                |                 |
| 1 jack post box - - -                          | 60              | 1 set 7-ft. tug pulley cants - - -                 | 464             |

For number and sizes of cants, see pages 59 and 60

NOTE—Where 9-inch brake irons are used, substitute 8 10-inch oak arms instead of 8 inch, on brake side of bull wheel, and add 16 1-inch pine cants.

## SPECIFICATION FOR 4½-INCH MANNINGTON RIG IRON OUTFIT

|                                               | Weight,<br>lbs. |                                                  | Weight,<br>lbs. |
|-----------------------------------------------|-----------------|--------------------------------------------------|-----------------|
| 1 shaft, crank, collar and wrist pin - - - -  | 552             | 8 D. E. bolts, ¾ x 18 inches - - - -             |                 |
| 1 pair flanges with keys and bolts - - - -    | 386             | Machine bolts, 12 ¾ x 20 in., 10 ¾ x 18 in.      | 200             |
| 1 set center irons complete - - - -           | 368             | 2 ¾ x 16 in., 2 ¾ x 14 in., 20 ¾ x 12 in., 4     |                 |
| 1 stirrup with bolts - - - -                  | 84              | ¾ x 10 in., 4 ¾ x 8 in., 10 ¾ x 18 in., 32 ¾     |                 |
| 2 bowl gudgeons with 2 bands and 8 bolts - -  | 200             | in. and 8 ¾ in. cast-iron washers, 40 ¾          |                 |
| 1 derrick or crown pulley, 30 inch - - - -    | 280             | in. wrought-iron washers - - - -                 |                 |
| 1 sand pump pulley for wire line, 24 inch - - | 90              | Nails, 150 lbs. 10d, 100 lbs. 20d, 200 lbs. 30d, | 450             |
| 1 brake band, ¾ inch x 9 inches x 28 feet - - | 213             | 1 40 in. oak head and oak shaft sand reel - -    | 1,030           |
| 1 brake lever, 1¾ inches x 9 feet - - - -     | 75              | 1 set 8 ft. bull wheel cants, arms and handles,  | 946             |
| 1 brake staple, 9-inch - - - -                | 8               | 1 set 10 ft. band wheel cants - - - -            | 464             |
| 1 back brake, 10 inches x 10 feet - - - -     | 15              | 1 set 7 ft. tug pulley cants - - - -             |                 |
| 1 jack post box - - - -                       | 60              |                                                  |                 |

For number and sizes of cants, see page 60.

## SPECIFICATION FOR CALIFORNIA RIG IRON OUTFIT

|                                                                      | Weight,<br>lbs. |                                                  | Weight,<br>lbs. |
|----------------------------------------------------------------------|-----------------|--------------------------------------------------|-----------------|
| 1 4½ in. x 6½ ft. shaft, crank, collar and wrist pin - - - -         | 562             | 1 set 7½-ft. bull wheel cants, arms and handles, | 735             |
| 1 pair flanges with keys and bolts - - - -                           | 386             | 1 set 9-ft. band wheel cants - - - -             | 235             |
| 1 set center irons complete - - - -                                  | 368             | 1 set 6½-ft. tug pulley cants - - - -            |                 |
| 1 stirrup with bolts - - - -                                         | 84              |                                                  |                 |
| 2-bowl gudgeons with 2 bands and 8 bolts - -                         | 200             |                                                  |                 |
| 1 derrick or crown pulley, 30 in. - - - -                            | 280             |                                                  |                 |
| 1 sand pump pulley for wire line, 24 in. - -                         | 90              |                                                  |                 |
| 1 brake band, ¾ in. x 7 in. x 26 ft. - - - -                         | 152             |                                                  |                 |
| 1 brake lever, 1¾ in. x 9 ft. - - - -                                | 75              |                                                  |                 |
| 1 brake staple, 7 in. - - - -                                        | 6               |                                                  |                 |
| 2 jack post eye bolts, 1½ in. x 8 ft., with nuts and washers - - - - | 67              |                                                  |                 |
| 2 hook rods, ¾ in. x 8 ft., with nuts and washers 1 end - - - -      | 30              |                                                  |                 |
| 2 eye bolts, ¾ x 16 in., with nuts and washers 1 end - - - -         | 8               |                                                  |                 |
| 2 bolts, 1x24 in., with nuts and washers 1 end,                      | 11              |                                                  |                 |
| 2 draw bolts, ¾ in. x 7½ ft., with nuts and washers - - - -          | 30              |                                                  |                 |
| 1 jack post stirrup - - - -                                          | 38              |                                                  |                 |
| 1 iron sand reel, 4-in. shaft - - - -                                | 1,372           |                                                  |                 |
| 1 sand reel lever - - - -                                            | 55              |                                                  |                 |

For number and sizes of cants, see pages 58-59. For foundry rig irons, see pages 54-56.

## SPECIFICATION FOR 5-INCH RIG IRON OUTFIT

|                                              | Weight,<br>lbs. |                                                  | Weight,<br>lbs. |
|----------------------------------------------|-----------------|--------------------------------------------------|-----------------|
| 1 shaft, crank, collar and wrist pin - - - - | 663             | 8 D. E. bolts, ¾ x 18 in. - - - -                | 200             |
| 1 pair flanges with keys and bolts - - - -   | 415             | Machine bolts, 10 ¾ x 18 in., 4 ¾ x 10 in.,      |                 |
| 1 set center irons complete - - - -          | 368             | 20 ¾ x 12 in., 2 ¾ x 14 in., 2 ¾ x 16 in.,       |                 |
| 1 stirrup with bolts - - - -                 | 84              | 12 ¾ x 20 in., 10 ¾ x 18 in., 4 ¾ x 8 in. -      |                 |
| 2-bowl gudgeons with 2 bands and 8 bolts - - | 200             | 32 ¾ in. and 8 ¾ in. cast iron washers - -       |                 |
| 1 derrick or crown pulley, 30 in. - - - -    | 280             | 40 ¾ in. wrought-iron washers - - - -            |                 |
| 1 sand pump pulley for wire line, 24 in. - - | 90              | Nails, 150 lbs. 10d, 100 lbs. 20d, 200 lbs. 30d, | 450             |
| 1 brake band, ¾ in. x 9 in. x 28 ft. - - - - | 213             | 1 40-in. oak head and oak shaft sand reel - -    | 1,030           |
| 1 brake lever, 1¾ in. x 9 ft. - - - -        | 75              | 1 set 7½-ft. bull wheel cants, arms and handles, | 869             |
| 1 brake staple, 9 in. - - - -                | 8               | 1 set 10-ft. band wheel cants - - - -            | 464             |
| 1 back brake, 10 in. x 10 ft. - - - -        | 55              | 1 set 7-ft. tug pulley cants - - - -             |                 |
| 1 jack post box - - - -                      | 60              |                                                  |                 |

For number and sizes of cants, see 4½-inch regular, with double tug, pages 59 and 60.

It will be observed that bull wheel shafts are not included in any of the foregoing specifications. This is due to the custom throughout the older oil fields of cutting the shafts from timber procured locally. Where such is not available, orders for rig iron outfits should clearly specify shafts, otherwise they will not be shipped. For weights and prices, see page 61.

## RIG BUILDERS' OUTFIT

| ARTICLES                                            | Fig. No.  | See pages |
|-----------------------------------------------------|-----------|-----------|
| 4 Double bit axes and handles - - - - -             | 5589-5696 | 313-322   |
| 1 Broad axe and handle - - - - -                    | 5591      | 313       |
| 2 Adzes and handles - - - - -                       | 5600-5702 | 314-322   |
| 1 Crosscut saw and handles - - - - -                | 5652-4-5  | 316       |
| 2 No. 7 Disston hand saws - - - - -                 | 5646      | 315       |
| 1 Saw vise - - - - -                                | 5657      | 316       |
| 1 Crosscut saw set - - - - -                        | - - - - - | - - - - - |
| 1 Hand saw set - - - - -                            | 5644      | 316       |
| 1 Raker gauge - - - - -                             | - - - - - | - - - - - |
| 1 Dozen 8-inch flat bastard files - - - - -         | 5731      | 317-318   |
| 1 Dozen 5-inch slim taper saw files - - - - -       | 5736      | 318       |
| 6 No. 3 oil king hatchets - - - - -                 | 5594      | 313       |
| 2 No. 7 steel squares - - - - -                     | 5667      | 321       |
| 1 No. 2 spirit level - - - - -                      | 5612      | 321       |
| 1 Plumb bob - - - - -                               | - - - - - | - - - - - |
| 1 1½-inch socket firmer chisel - - - - -            | 5626      | 314       |
| 1 1½-inch socket firmer gouge - - - - -             | 5628      | 314       |
| 1 3-inch slick - - - - -                            | 5632      | 314       |
| 1 10-inch common draw knife - - - - -               | 5614      | 314       |
| 1 Pair 10-inch dividers - - - - -                   | - - - - - | - - - - - |
| 1 100-foot heavy chalk line - - - - -               | - - - - - | - - - - - |
| 1 100-foot light chalk line - - - - -               | - - - - - | - - - - - |
| 1 Dozen balls blue chalk - - - - -                  | - - - - - | - - - - - |
| 1 2-inch auger - - - - -                            | 5575-5577 | 319       |
| 1 1½-inch auger - - - - -                           | 5575-5577 | 319       |
| 1 1-inch ship auger - - - - -                       | 5583      | 319       |
| 4 No. 24 Swans auger handles - - - - -              | 5720      | 322       |
| 1 12-pound sledge and handle - - - - -              | 2441-5700 | 277-322   |
| 1 Wood mallet - - - - -                             | - - - - - | - - - - - |
| 1 Spike maul - - - - -                              | - - - - - | - - - - - |
| 2 Iron wedges - - - - -                             | - - - - - | - - - - - |
| 2 Mattocks and handles - - - - -                    | 5538-5698 | 317-322   |
| 2 No. 2 D. H. shovels - - - - -                     | 5815      | 328       |
| 1 7-inch single wrought-iron pulley block - - - - - | 5303      | 308       |
| 1 Pulley - - - - -                                  | 5692      | 277       |
| 1 Pulley hook (dog) - - - - -                       | - - - - - | - - - - - |
| 1 Crow bar - - - - -                                | - - - - - | - - - - - |
| 1 15-inch combination wrench - - - - -              | 5183      | 273       |
| 1 12-inch screw wrench - - - - -                    | - - - - - | - - - - - |
| 4 Socket peavies - - - - -                          | 5808      | 327       |
| 3 Feet ¾-inch octagon steel - - - - -               | - - - - - | - - - - - |
| 185 Feet 1¼-inch plain rope - - - - -               | - - - - - | - - - - - |
| 185 Feet ¾-inch plain rope - - - - -                | - - - - - | - - - - - |

The Rig Builders' Outfit, consisting of tools as specified, is complete, and such as is used by the practical rig builders throughout the oil country. We can supply the entire outfit, packed in a substantial chest measuring 6 feet x 2 feet x 18 inches. Price, \$75.00.

**Weight complete, 450 pounds.**

## OIL COUNTRY BOILER

## LOCOMOTIVE TYPE

These boilers are larger than other makes for the same power. They are of the style universally used for drilling wells.

They are made of open hearth flange steel, having a tensile strength of 60,000 pounds per square inch, an elastic limit of 30,000 pounds, elongation of 20 per cent in an 8-inch section, and will reduce in area 45 to 50 per cent and turn over and close down solid when cold without fracture, and will do the same after heating and plunging into cold water and will not blister.

Fig. 1400

These boilers have unusual fire box surfaces, and storage room for steam.

They are double riveted in the longitudinal seams. They do not foam or prime under any ordinary circumstances, even with quite foul water.

Every boiler is carefully inspected at 160 pounds hydrostatic pressure and 125 pounds steam pressure per square inch.

SPECIFICATIONS OF OIL COUNTRY BOILERS  
LOCOMOTIVE TYPE

| Horse power - - - - -                                  | 15       | 20      | 25      | 30      | 40      |
|--------------------------------------------------------|----------|---------|---------|---------|---------|
| Length of boiler - - - - -                             | 12' 8"   | 13' 8"  | 13' 10" | 15' 10" | 15' 10" |
| Height of boiler - - - - -                             | 6' 0"    | 7' 6"   | 7' 11"  | 8' 7"   | 9' 1"   |
| Diameter of boiler - - - - - inches                    | 30       | 36      | 38      | 42      | 44      |
| Diameter of dome - - - - - inches                      | 22       | 28      | 30      | 32      | 36      |
| Height of dome - - - - - inches                        | 25       | 33      | 36½     | 36½     | 39½     |
| Length of furnace - - - - - inches                     | 48       | 48      | 50      | 50      | 50      |
| Height of furnace - - - - - inches                     | 30       | 36      | 38      | 42      | 44      |
| Width of furnace - - - - - inches                      | 30       | 36      | 38      | 42      | 44      |
| Number of tubes - - - - -                              | 30       | 36      | 43      | 48      | 54      |
| Length of tubes - - - - - feet                         | 7        | 8       | 8       | 10      | 10      |
| Diameter of tubes - - - - - inches                     | 3        | 3       | 3       | 3       | 3       |
| Thickness of wagon top - - - - - inches                | ¼        | ¼       | ¼       | ¼       | ¼       |
| Thickness of fire box - - - - - inches                 | ¼        | ¼       | ¼       | ¼       | ¼       |
| Thickness of waist or shell - - - - - inches           | ¼        | ¼       | ¼       | ¼       | ¼       |
| Thickness of dome - - - - - inches                     | ¼        | ¼       | ¼       | ¼       | ¼       |
| Thickness of flue sheet, rear - - - - - inches         | 11<br>32 | 8<br>3  | 8<br>3  | 8<br>3  | 7<br>16 |
| Thickness of flue sheet, fire box end - - - - - inches | 8<br>3   | 8<br>3  | 8<br>3  | 7<br>16 | 7<br>16 |
| Thickness of dome head - - - - - inches                | 1<br>8   | 5<br>16 | 5<br>16 | 5<br>16 | 5<br>16 |
| Thickness of front of boiler - - - - - inches          | 1<br>8   | 5<br>16 | 5<br>16 | 5<br>16 | 5<br>16 |
| Thickness of throat sheet - - - - - inches             | 5<br>16  | 5<br>16 | 5<br>16 | 5<br>16 | 5<br>16 |
| Thickness of reducer - - - - - inches                  | ¼        | ¼       | ¼       | ¼       | 9<br>32 |
| Thickness of rouse ring - - - - - inches               | ¼        | ¼       | ¼       | ¼       | ¼       |
| Thickness of front furnace head - - - - - inches       | 5<br>16  | 5<br>16 | 5<br>16 | 5<br>16 | 5<br>16 |
| Diameter of rivets - - - - - inches                    | ¾        | ¾       | ¾       | ¾       | ¾       |
| Length of smoke stack - - - - - feet                   | 25       | 25      | 25      | 30      | 32      |
| Diameter of smoke stack - - - - - inches               | 16       | 18      | 20      | 22      | 24      |
| Steam opening in dome - - - - - inches                 | 3        | 3       | 3       | 3       | 3       |
| Diameter of pop valve - - - - - inches                 | 2        | 2       | 2       | 2       | 2       |
| Weight - - - - - lbs.                                  | 4,350    | 5,800   | 6,500   | 7,800   | 8,600   |
| Price - - - - -                                        | \$425 00 | 435 00  | 465 00  | 575 00  | 725 00  |

Staybolts are ¾-inch diameter and are placed 5 inches apart.

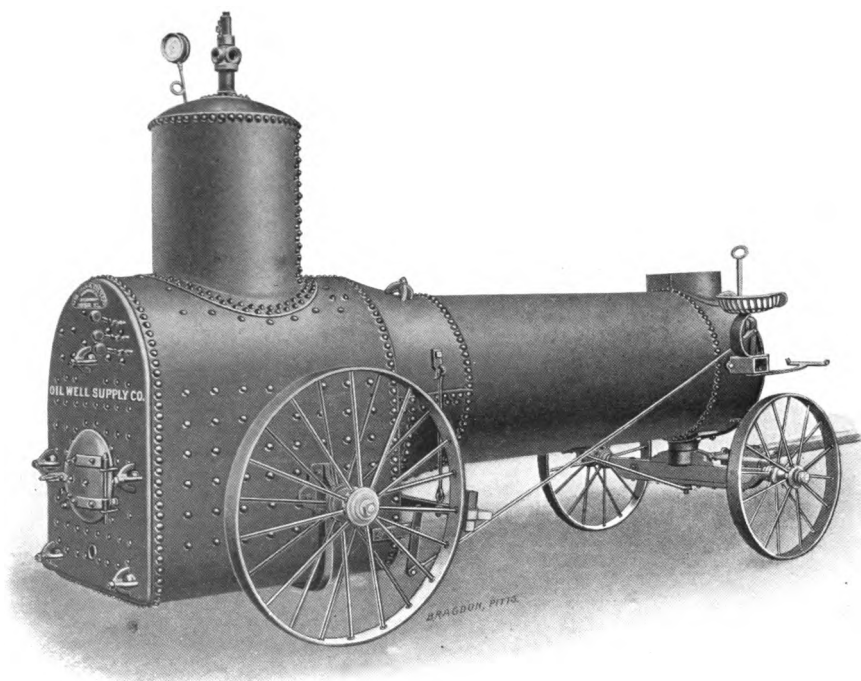
Fixtures for these boilers include either lever safety or O. W. S. Co. pop safety valve as desired; grates, grate rests, steam gauge, three gauge cocks, blow-off cock, feed and check valves, four nipples, stack, and guy wires with hooks.



## MOUNTED PORTABLE BOILER

### LOCOMOTIVE TYPE

Fig. 1405



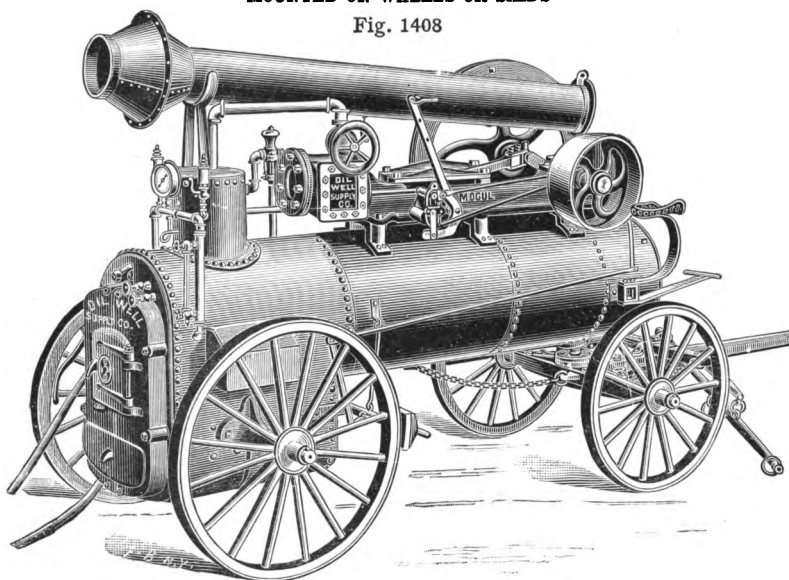
The wheels are made with heavy cast-iron hubs and wrought-iron spokes and rims. The axles are heavy forgings, strongly attached to boiler. We carry in stock, 15, 20 and 25 horse-power boilers, mounted as shown in illustration. Specifications and descriptions same as locomotive type boilers, page 71.

| Horse power- - - - -  | 15       | 20     | 25     | 30     | 40     |
|-----------------------|----------|--------|--------|--------|--------|
| Weight - - - - - lbs. | 6,000    | 7,600  | 8,500  | 10,000 | 11,000 |
| Price - - - - -       | \$575 00 | 585 00 | 627 00 | 750 00 | 900 00 |

## ENGINE AND BOILER FOR DRILLING WELLS

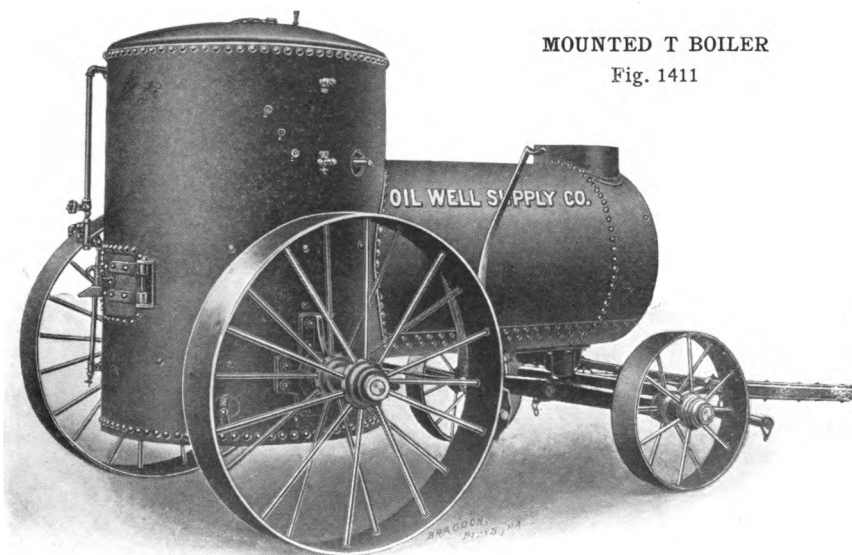
MOUNTED ON WHEELS OR SKIDS

Fig. 1408



MOUNTED T BOILER

Fig. 1411



For specifications, see page 74.

## MOUNTED DRILLING BOILER AND ENGINE SPECIFICATIONS, FIG. 1408

| Number of size - - - - -                             | 1     | 2     | 3      | 4      | 5      |
|------------------------------------------------------|-------|-------|--------|--------|--------|
| Horse power, as usually rated - - - - -              | 6     | 8     | 10     | 12     | 15     |
| Diameter of cylinder and length of stroke - - inches | 5 x 6 | 6 x 8 | 7 x 10 | 8 x 10 | 8 x 12 |
| Usual number of revolutions - - - - -                | 230   | 220   | 175    | 175    | 150    |
| Diameter of boiler - - - - - inches                  | 26    | 28    | 30     | 32     | 32     |
| Length of furnace, inside - - - - - inches           | 34    | 36    | 38     | 38     | 44     |
| Width of furnace, inside - - - - - inches            | 21    | 22    | 24     | 26     | 26     |
| Height of furnace - - - - - inches                   | 29    | 33    | 35     | 35     | 35     |
| Number of tubes (all 3 inch) - - - - -               | 17    | 20    | 22     | 26     | 26     |
| Length of tubes - - - - - inches                     | 60    | 72    | 78     | 78     | 78     |
| Diameter of stack - - - - - inches                   | 12    | 14    | 14     | 16     | 16     |
| Length of stack - - - - - feet                       | 18    | 20    | 20     | 20     | 20     |
| Weight complete, on skids - - - - -                  | 4,200 | 5,000 | 6,100  | 6,500  | 7,400  |
| Weight complete, mounted on wheels - - - about       | 4,300 | 5,100 | 6,200  | 6,600  | 7,600  |

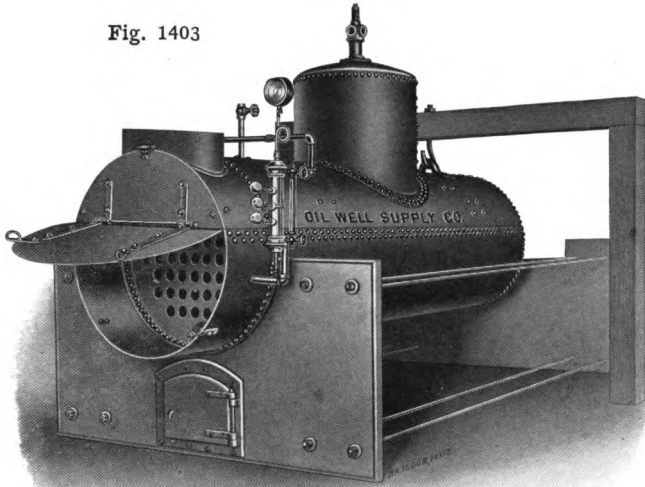
Prices on application

## MOUNTED T BOILER SPECIFICATIONS

Fig. 1411, see page 73

|                                   |        |          |
|-----------------------------------|--------|----------|
| Diameter of body - - - - -        | inches | 44       |
| Height over all - - - - -         | inches | 84       |
| Diameter of shell - - - - -       | inches | 34       |
| Length of boiler - - - - -        | feet   | 10       |
| Length of fire box - - - - -      | inches | 36       |
| Width of fire box - - - - -       | inches | 36       |
| Height of fire box - - - - -      | inches | 36       |
| Diameter of smoke stack - - - - - | inches | 18       |
| Length of smoke stack - - - - -   | feet   | 27       |
| Length of tubes - - - - -         | feet   | 6        |
| Number of 3 inch tubes - - - - -  |        | 36       |
| Weight of boiler - - - - -        | pounds | 4960     |
| Price - - - - -                   |        | \$380 00 |

Fig. 1403



## HORIZONTAL TUBULAR DRILLING OR PUMPING BOILER

### CALIFORNIA TYPE

These boilers are built for general service, but were especially designed to meet a demand in the California oil fields where the natural "adobe" is used in place of brick to close in the boiler. They make steam rapidly and freely, and are easily handled and set up. Care should be observed in placing orders to state whether wood, coal, oil, or gas will be used as fuel, and proper fittings for either will be furnished with the boiler.

Fixtures furnished with California type boilers include smoke stack, guy wires, four-way steam head with pop safety valve, steam gauge complete, water column with three gauge cocks, blow-off cock, and feed valve.

Fittings, including front and rear castings, tie bolts, and grate bars, are furnished only when ordered, as they vary to conform with the fuel to be used.

## SPECIFICATIONS

| Horse power as usually rated - - - - -        | 25       | 30     | 35     | 40     | 45     |
|-----------------------------------------------|----------|--------|--------|--------|--------|
| Diameter of boiler - - - - - inches           | 36       | 40     | 42     | 46     | 48     |
| Length of tubes - - - - - feet                | 12       | 12     | 12     | 12     | 12     |
| Length of britchen - - - - - inches           | 16       | 16     | 16     | 16     | 16     |
| Number of tubes - - - - - 3-inch diameter     | 26       | 34     | 40     | 42     | 48     |
| Diameter of dome - - - - - inches             | 28       | 30     | 32     | 36     | 36     |
| Height of dome - - - - - inches               | 28       | 28     | 28     | 30     | 30     |
| Length of grates - - - - - inches             | 42       | 42     | 45     | 48     | 48     |
| Width of grates - - - - - inches              | 36       | 40     | 42     | 46     | 48     |
| Total grate surface - - - - - square feet     | 10.5     | 11.66  | 13.12  | 15.33  | 16     |
| Diameter of smoke stack - - - - - inches      | 20       | 20     | 22     | 22     | 24     |
| Length of smoke stack - - - - - feet          | 25       | 25     | 25     | 25     | 25     |
| Size of steam outlet - - - - - inches         | 3        | 3      | 3      | 3      | 3      |
| Size of pop-safety valve - - - - - inches     | 2        | 2½     | 2½     | 2½     | 2½     |
| Size of blow-off valve - - - - - inches       | 2        | 2      | 2      | 2      | 2      |
| Thickness of shell - - - - - inches           | 5/16     | 5/16   | 5/16   | 5/16   | 5/16   |
| Thickness of heads - - - - - inches           | 3/8      | 3/8    | 3/8    | 3/8    | 3/8    |
| Thickness of dome shell - - - - - inches      | 3/8      | 3/8    | 3/8    | 3/8    | 3/8    |
| Thickness of dome head - - - - - inches       | 5/16     | 5/16   | 5/16   | 5/16   | 5/16   |
| Weight of boiler, about - - - - - lbs.        | 3,440    | 3,800  | 4,605  | 4,900  | 5,575  |
| Weight of fixtures, about - - - - - lbs.      | 2,232    | 2,294  | 2,378  | 2,653  | 2,703  |
| Weight of boiler and fixtures, about - - lbs. | 5,672    | 6,094  | 6,983  | 7,553  | 8,278  |
| Price - - - - -                               | \$270 00 | 310 00 | 350 00 | 375 00 | 425 00 |

Grate bars, when required, extra

FRONT AND REAR CASTINGS AND TIE BOLTS FOR CALIFORNIA TYPE BOILERS

EXTRA AS FOLLOWS:

|                                               |         |
|-----------------------------------------------|---------|
| For 25 horse-power boiler, complete - - - - - | \$64 00 |
| For 30 horse-power boiler, complete - - - - - | 65 00   |
| For 35 horse-power boiler, complete - - - - - | 66 00   |
| For 40 horse-power boiler complete - - - - -  | 67 50   |

BOILER TOOLS AND ATTACHMENTS

|                        |                 |
|------------------------|-----------------|
| Smoke stacks - - - - - | per lb., \$0 10 |
| Grate bars - - - - -   | per lb., 05     |

BOILER GRATE BAR REST

Fig. 3134



|                          |        |
|--------------------------|--------|
| Per set of two - - - - - | \$2 50 |
|--------------------------|--------|

Weight per set, 21 lbs.

**BOILER TOOLS AND ATTACHMENTS****BOILER TUBES**

| Size outside diameter, inches | Price per foot | Thickness, inches | Thickness nearest Bgm. W. G. | Nominal weight per foot |
|-------------------------------|----------------|-------------------|------------------------------|-------------------------|
| 1                             | \$0 30         | .095              | 13                           | .90                     |
| 1 $\frac{1}{4}$               | 28             | .095              | 13                           | 1.15                    |
| 1 $\frac{1}{2}$               | 27             | .095              | 13                           | 1.40                    |
| 1 $\frac{3}{4}$               | 22             | .095              | 13                           | 1.66                    |
| 2                             | 20             | .095              | 13                           | 1.91                    |
| 2 $\frac{1}{4}$               | 24             | .095              | 13                           | 2.16                    |
| 2 $\frac{1}{2}$               | 28             | .109              | 12                           | 2.75                    |
| 2 $\frac{3}{4}$               | 34             | .109              | 12                           | 3 04                    |
| 3                             | 35             | .109              | 12                           | 3.33                    |
| 3 $\frac{1}{4}$               | 40             | .120              | 11                           | 3.96                    |
| 3 $\frac{1}{2}$               | 44             | .120              | 11                           | 4.28                    |
| 3 $\frac{3}{4}$               | 50             | .120              | 11                           | 4.60                    |
| 4                             | 55             | .134              | 10                           | 5.47                    |
| 4 $\frac{1}{2}$               | 62             | .134              | 10                           | 6 17                    |
| 5                             | 75             | .148              | 9                            | 7.58                    |
| 6                             | 1 00           | .165              | 8                            | 10.16                   |
| 7                             | 1 20           | .165              | 8                            | 11.90                   |
| 8                             | 1 50           | .165              | 8                            | 13.65                   |
| 9                             | 1 70           | .180              | 7                            | 16.76                   |
| 10                            | 2 10           | .203              | 6                            | 21.00                   |
| 11                            | 2 50           | .220              | 5                            | 25.00                   |
| 12                            | 2 90           | .229              | 4 $\frac{1}{2}$              | 23.50                   |
| 13                            | 3 20           | .238              | 4                            | 32.06                   |
| 14                            | 3 65           | .248              | 3 $\frac{1}{2}$              | 36.00                   |
| 15                            | 4 10           | .259              | 3                            | 40.60                   |
| 16                            | 4 60           | .270              | 2 $\frac{1}{2}$              | 45 20                   |

The above prices are for tubes up to 20 feet long—for tubes in excess of that length, 10 per cent will be added to net of invoice.

Extra thickness of tubes will be charged as per list of extra gauges.

Extra heavy or hydraulic tubes.

Special prices given on application.

Patent boiler connection for 1 inch pipe, each.....\$1.10

**BOILER TUBE SAFE ENDS**

Not illustrated.

To 6 inches long. Over 6 inches long, extra length will be charged in proportion.

| Size  | 2      | 2 $\frac{1}{4}$ | 2 $\frac{1}{2}$ | 2 $\frac{3}{4}$ | 3  | 3 $\frac{1}{4}$ | 3 $\frac{1}{2}$ | 3 $\frac{3}{4}$ | 4  | 4 $\frac{1}{2}$ | 5  | 6  |
|-------|--------|-----------------|-----------------|-----------------|----|-----------------|-----------------|-----------------|----|-----------------|----|----|
| Price | \$0 13 | 14              | 16              | 20              | 20 | 22              | 25              | 27              | 29 | 32              | 37 | 45 |

**FLUE PLUGS**

Fig. 3122



Sq. Head

Fig. 3124



Plain

| Size flue | inches | 2 $\frac{1}{2}$ | 3  |
|-----------|--------|-----------------|----|
| Fig. 3122 |        | \$0 35          | 45 |
| Weight    | lbs.   | 2.5             | 4  |
| Fig. 3124 |        | \$0 25          | 35 |
| Weight    | lbs.   | 2               | 3  |

BOILER TOOLS AND ATTACHMENTS



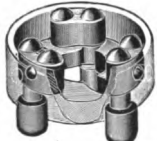
DUDGEON TYPE TUBE EXPANDERS  
Fig. 3105

|                       |         |       |       |       |       |       |       |       |       |
|-----------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| Diameter - - - inches | 1       | 1¼    | 1½    | 1¾    | 1⅞    | 2     | 2¼    | 2½    | 2¾    |
| Price - - - - -       | \$10 00 | 10 00 | 10 00 | 10 00 | 10 00 | 10 00 | 12 00 | 14 00 | 16 00 |
| Diameter - - - inches | 3       | 3¼    | 3½    | 3¾    | 4     | 4¼    | 4½    | 5     | 6     |
| Price - - - - -       | \$18 00 | 20 00 | 23 00 | 25 00 | 30 00 | 35 00 | 40 00 | 50 00 | 60 00 |

DUDGEON TUBE EXPANDER PARTS

|                          |        |      |      |      |      |      |      |       |       |
|--------------------------|--------|------|------|------|------|------|------|-------|-------|
| Size - - - - inches      | 1      | 1¼   | 1½   | 1¾   | 1⅞   | 2    | 2¼   | 2½    | 2¾    |
| Mandrels - - - each      | \$1 00 | 1 50 | 1 75 | 2 00 | 2 50 | 2 50 | 3 00 | 3 50  | 3 50  |
| Rolls, per set (3) - - - | 50     | 60   | 70   | 80   | 90   | 1 00 | 1 15 | 1 30  | 1 45  |
| Size - - - - inches      | 3      | 3¼   | 3½   | 3¾   | 4    | 4¼   | 4½   | 5     | 6     |
| Mandrels - - - each      | \$4 00 | 4 50 | 5 00 | 5 75 | 6 50 | 7 25 | 8 00 | 10 00 | 15 00 |
| Rolls, per set (3) - - - | 1 60   | 1 75 | 2 00 | 2 25 | 2 50 | 3 00 | 3 50 | 4 00  | 5 00  |

These dimensions refer to the external diameter of Tube.



GILES' TUBE EXPANDERS, Fig. 3107  
ADJUSTABLE THREE ROLLER. PATENTED.

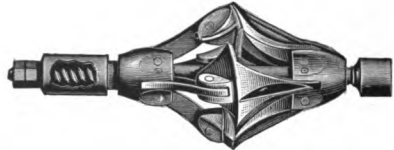
- No. 100. Expands 2, 2¼, 2½, 2¾ and 3 inch tubes - - \$15 00  
No. 200. Expands 3, 3¼, 3½, 3¾ and 4 inch tubes - - 25 00



FLUE CLEANERS

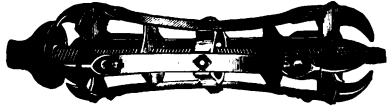
INGALL'S  
Fig. 3101

FREEMAN'S  
Fig. 3100



|                           |        |      |      |      |      |      |      |      |      |      |
|---------------------------|--------|------|------|------|------|------|------|------|------|------|
| Size of flue - - - inches | 1¾     | 2    | 2¼   | 2½   | 2¾   | 3    | 3¼   | 3½   | 3¾   | 4    |
| Freeman's Fig. 3100 - - - | \$1 75 | 2 00 | 2 25 | 2 50 | 2 75 | 3 00 | 3 25 | 3 50 | 3 75 | 4 00 |
| Ingall's Fig. 3101 - - -  | 1 75   | 2 00 | 2 25 | 2 50 | 2 75 | 3 00 | 3 25 | 3 50 | 3 75 | 4 00 |

ENGINEER'S FAVORITE, Fig. 3103



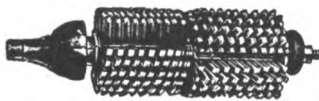
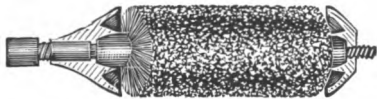
|                      |        |      |      |      |      |      |
|----------------------|--------|------|------|------|------|------|
| Size of flue - - in. | 2      | 2¼   | 2½   | 3    | 3¼   | 4    |
| Price - - - -        | \$2 00 | 2 25 | 2 50 | 3 00 | 3 50 | 4 00 |

FLUE BRUSHES

ABRAM'S  
Fig. 3110

ABRAM'S EXPANSION  
Fig. 3112

SPIRAL  
Fig. 3114



- Abram's, Fig. 3110 - - - - - per inch diameter, \$1 00  
Abram's expansion, Fig. 3112 - - - - - per inch diameter, 1 00  
Spiral, Fig. 3114 - - - - - per inch diameter, 1 00

## BOILER TOOLS AND ATTACHMENTS



STEEL WIRE FLUE BRUSH WITH GUARDS

Fig. 3116

Per inch diameter - - - - - \$1 00  
These brushes are made from 10 inches up.

Fig. 3118



External

Fig. 3120



Internal

## BOILER BRUSHES

| For diam. boiler, in. | 28     | 30   | 32   | 34   | 36   | 38   | 40   | 42   | 44   | 46   | 48   | 50   | 52   |
|-----------------------|--------|------|------|------|------|------|------|------|------|------|------|------|------|
| Fig. 3118 or 3120 -   | \$1 00 | 1 25 | 1 50 | 1 75 | 2 00 | 2 25 | 2 50 | 2 75 | 3 00 | 3 25 | 3 50 | 3 75 | 4 00 |

Fig. 3128

## HAND HOLE PLATE

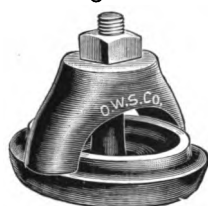


Fig. 3126

| Size - - - inches   | 2½ x 3½ | 3 x 4 | 3½ x 4½ | 3 x 5 | 3½ x 5 | 4 x 5 |
|---------------------|---------|-------|---------|-------|--------|-------|
| Complete - - - -    | \$0 75  | 75    | 85      | 1 00  | 1 00   | 1 00  |
| Bolts, only - - - - | 25      | 25    | 25      | 25    | 25     | 25    |
| Crow feet - - - -   | 25      | 25    | 25      | 30    | 30     | 30    |
| Plate - - - - -     | 25      | 25    | 25      | 35    | 35     | 35    |
| Gaskets - - - - -   | 10      | 10    | 10      | 12    | 12     | 12    |
| Weight - - - - lbs. | 6.5     | 6.5   | 7.5     | 9     | 9      | 10    |

## STAY BOLT BUSHINGS

(One Dozen.)



Per dozen - - - - - \$4 25

The bushing is screwed in with a wrench and broken off; the hole in bushing is then tapped for stay bolt.

Fig. 3130

## SOFT OR FUSIBLE PLUGS

Fig. 3133



| Sizes - - - inches                      | ½      | ¾  | 1    | 1¼   | 1½   | 2    |
|-----------------------------------------|--------|----|------|------|------|------|
| Short, fig. 3130 }<br>Long, fig. 3133 } | \$0 60 | 75 | 1 00 | 1 50 | 2 00 | 3 00 |

WEIGHTED GAUGE COCK  
REGISTER PATTERN

Fig. 4750



| Sizes - - - inches  | ¾      | 1    | 1½   |
|---------------------|--------|------|------|
| Price - - - - -     | \$1 00 | 1 00 | 1 00 |
| Weight - - - - lbs. | 2      | 2    | 2.3  |



# BOILER TOOLS AND ATTACHMENTS

## STEAM GAUGE

WITH IRON OR BRASS CASE

BOURDON SINGLE SPRING

Including cock

| Fig. 5339                                                                         | Sizes             | Iron case,<br>brass ring | Iron case,<br>n. p. ring | Brass case | Nickel<br>plated case | Weight,<br>lbs. |
|-----------------------------------------------------------------------------------|-------------------|--------------------------|--------------------------|------------|-----------------------|-----------------|
|  | 12 -inch dial - - | \$50 00                  | 51 50                    | 75 00      | 79 00                 | 24              |
|                                                                                   | 10 -inch dial - - | 32 00                    | 33 00                    | 40 00      | 43 00                 | 13              |
|                                                                                   | 8½-inch dial - -  | 22 00                    | 22 75                    | 30 00      | 32 50                 | 9               |
|                                                                                   | 6¾-inch dial - -  | 16 00                    | 16 60                    | 20 00      | 22 00                 | 8               |
|                                                                                   | 6 -inch dial - -  | 13 00                    | 13 50                    | 16 00      | 17 50                 | 5               |
|                                                                                   | 5½-inch dial - -  | 10 00                    | 10 25                    | 12 00      | 13 25                 | 4.3             |
|                                                                                   | 5 -inch dial - -  | 8 00                     | 8 20                     | 11 00      | 12 00                 | 3.3             |
|                                                                                   | 4½-inch dial - -  | 8 00                     | 8 20                     | 10 00      | 11 00                 | 3               |
|                                                                                   | 3½-inch dial - -  | 7 00                     | 7 18                     | 9 00       | 9 75                  | 1.5             |
|                                                                                   | 3 -inch dial - -  | 6 00                     | 6 15                     | 8 00       | 8 60                  | 1               |

## BOURDON DOUBLE SPRING

| Sizes                   | Iron case, japanned | Iron case, n. p. ring | Brass case | Nickel plated case |
|-------------------------|---------------------|-----------------------|------------|--------------------|
| 12 -inch dial - - - - - | \$55 00             | 56 50                 | 80 00      | 84 00              |
| 10 -inch dial - - - - - | 37 00               | 38 00                 | 45 00      | 48 00              |
| 8½ -inch dial - - - - - | 25 00               | 25 75                 | 34 00      | 36 50              |
| 6¾ -inch dial - - - - - | 18 00               | 18 60                 | 22 00      | 24 00              |
| 6 -inch dial - - - - -  | 15 00               | 15 50                 | 18 00      | 19 50              |
| 5½ -inch dial - - - - - | 12 00               | 12 25                 | 14 00      | 15 25              |
| 5 -inch dial - - - - -  | 11 00               | 11 20                 | 13 00      | 14 00              |
| 4½ -inch dial - - - - - | 10 00               | 10 20                 | 12 00      | 13 00              |

Fig. 5337



## SYPHON

FOR STEAM GAUGES

Price - - - - - \$0 25

Weight, .5 pound

Fig. 4683



## POP SAFETY VALVE—BRASS

| Sizes - - - - inches | ½      | ¾     | 1     | 1¼    | 1½    | 2     |
|----------------------|--------|-------|-------|-------|-------|-------|
| Price - - - - -      | \$8 00 | 10 00 | 12 00 | 15 00 | 20 00 | 30 00 |
| Weight - - - - lbs.  | 2.5    | 3.5   | 4     | 5     | 8     |       |

## KUNKLE POP SAFETY VALVE—BRASS

| Size - - - - - inches  | ¾        | 1         | 1¼       | 1½       | 2        | 2½       |
|------------------------|----------|-----------|----------|----------|----------|----------|
| Horse power - - - -    | 2 to 5   | 5 to 10   | 10 to 15 | 15 to 20 | 20 to 35 | 35 to 60 |
| With direct outlet - - | \$9 00   | 10 00     | 12 00    | 15 00    | 25 00    | 35 00    |
| With side outlet - - - | 10 00    | 12 00     | 14 00    | 17 00    | 28 00    | 40 00    |
| Size - - - - - inches  | 3        | 3½        | 4        | 4½       | 5        | 6        |
| Horse power - - - -    | 60 to 90 | 90 to 120 | -----    | -----    | -----    | -----    |
| With direct outlet - - | \$50 00  | 70 00     | 90 00    | 110 00   | 140 00   | 180 00   |
| With side outlet - - - | 56 00    | 78 00     | 100 00   | 125 00   | 160 00   | 200 00   |

## BOILER TOOLS AND ATTACHMENTS

### O. W. S. CO. PATENT POP SAFETY VALVE

Fig. 4624



Our boilers are fitted with the patent pop safety valve, which combines all the most desirable features for convenience and safety. Three-inch opening to boiler for passage of steam under great draft without syphoning; four standard two-inch openings for straight connections to a number of motors when desired.

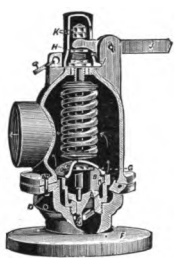
As more than three engines are seldom run from one boiler, the fourth opening can be used for attaching a common I. B. lever safety valve, which can be gauged to blow off at a slightly greater pressure than the pop valve, thus adding an element of safety, as any pop valve may stick, while the lever valve may be frequently tested by merely raising the lever.

Weight, 18 lbs. - - - - - Price, \$20 00

### IRON BODY POP SAFETY VALVE

#### SCREWED OR FLANGED ENDS

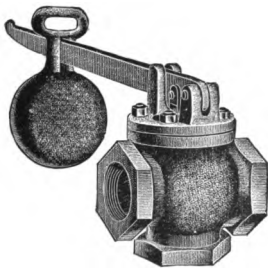
Fig. 4623



| Sizes - - - - - inches | 2        | 2½     | 3      | 3½     |
|------------------------|----------|--------|--------|--------|
| Each - - - - -         | \$30 00  | 50 00  | 65 00  | 80 00  |
| With lock up - - - - - | 35 00    | 55 00  | 75 00  | 90 00  |
| Weight - - - - - lbs.  | 22.5     | - - -  | 46     | - - -  |
| Sizes - - - - - inches | 4        | 4½     | 5      | 6      |
| Each - - - - -         | \$100 00 | 115 00 | 125 00 | 180 00 |
| With lock up - - - - - | 110 00   | 125 00 | 135 00 | 200 00 |
| Weight - - - - - lbs.  | - - -    | - - -  | - - -  | - - -  |

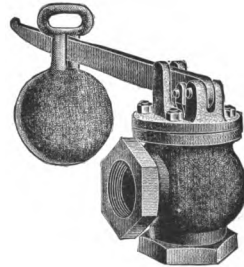
### STANDARD IRON BODY SAFETY VALVES

Fig. 4950



Cross, screwed

Fig. 4953



Angle, screwed

NOTE—3 inches and larger have iron top bolted on, 2½ inches and smaller have swivel top.

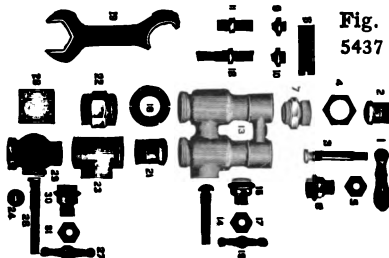
| Sizes - - - - - inches              | ¾       | 1     | 1¼    | 1½    | 2     | 2½    | 3      |
|-------------------------------------|---------|-------|-------|-------|-------|-------|--------|
| Screwed, figs. 4950, - - - - -      | \$3 50  | 4 00  | 5 00  | 5 80  | 7 80  | 13 25 | 17 25  |
| Weight - - - - - lbs.               | - - -   | 13    | 16    | 19    | 29    | 68    | 99     |
| Sizes - - - - - inches              | 3½      | 4     | 4½    | 5     | 6     | 7     | 8      |
| Screwed, figs. 4950, 4953 - - - - - | \$23 00 | 28 75 | 34 50 | 41 50 | 57 75 | 93 50 | 132 00 |
| Weight - - - - - lbs.               | - - -   | 183   | 187   | - - - | 378   | - - - | - - -  |



## BOILER TOOLS AND ATTACHMENTS

## HANCOCK INSPIRATOR AND PARTS

Fig. 5435

Fig.  
5437

| No. | Price   | SIZE OF CONNECTION |       | Gallons per hour<br>60 lbs. pressure | Weight,<br>lbs. |
|-----|---------|--------------------|-------|--------------------------------------|-----------------|
|     |         | Suction and feed   | Steam |                                      |                 |
| 7½  | \$16 00 | ¾                  | ¾     | 60                                   | 5               |
| 8¾  | 18 00   | ½                  | ¾     | 90                                   | 6               |
| 10  | 20 00   | ½                  | ¾     | 120                                  | 6               |
| 12½ | 25 00   | ¾                  | ½     | 220                                  | 8.5             |
| 15  | 30 00   | ¾                  | ½     | 300                                  | 8.5             |
| 17½ | 40 00   | 1                  | ¾     | 420                                  | 12              |
| 20  | 45 00   | 1                  | ¾     | 540                                  | 12              |
| 22½ | 55 00   | 1½                 | 1     | 720                                  | 21              |
| 25  | 60 00   | 1½                 | 1     | 900                                  | 21              |
| 30  | 75 00   | 1½                 | 1½    | 1,260                                | 28              |
| 35  | 90 00   | 1½                 | 1½    | 1,740                                | 35              |
| 40  | 110 00  | 2                  | 1½    | 2,230                                | 40              |
| 45  | 125 00  | 2                  | 1½    | 2,820                                | 46              |
| 50  | 150 00  | 2½                 | 2     | 3,480                                | 65              |

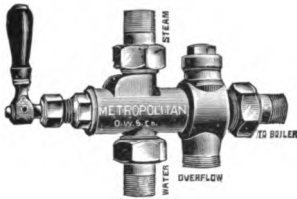
## HANCOCK INSPIRATOR PARTS. Fig. 5437

| No. | Size of Inspirator                            | 7½     | 8¾<br>and<br>10 | 12½<br>and<br>15 | 17½<br>and<br>20 | 22½<br>and<br>25 | 30<br>and<br>35 | 40<br>and<br>45 | 50<br>and<br>55 |
|-----|-----------------------------------------------|--------|-----------------|------------------|------------------|------------------|-----------------|-----------------|-----------------|
| 1   | Handle for top bonnet.....                    | \$0.75 | .75             | .90              | 1.05             | 1.40             | 1.90            | 2.40            | 2.90            |
| 2   | Nipple for steam connection.....              | .40    | .40             | .50              | 1.00             | 1.30             | 2.00            | 2.40            | 3.15            |
| 3   | Stem for top bonnet.....                      | .90    | .90             | 1.60             | 2.50             | 3.50             | 4.50            | 5.20            | 6.00            |
| 4   | Coupling nut for steam connection.....        | .70    | .70             | .85              | 1.20             | 1.75             | 2.40            | 3.00            | 4.25            |
| 5   | Packing nut for top bonnet.....               | .50    | .50             | .60              | .70              | .80              | 1.00            | 1.20            | 1.50            |
| 6   | Jet wrench.....                               | .20    | .20             | .30              | .40              | .50              | .80             | 1.15            | 1.95            |
| 7   | Union.....                                    | .95    | .95             | 1.35             | 1.75             | 2.40             | 3.95            | 6.10            | 9.20            |
| 8   | Top bonnet.....                               | .80    | .80             | 1.40             | 2.00             | 2.60             | 3.40            | 4.40            | 5.60            |
| 9   | Lifter steam jet.....                         | .60    | .60             | .75              | .90              | 1.70             | 2.25            | 3.00            | 5.50            |
| 10  | Forcer steam jet.....                         | .85    | .85             | 1.00             | 1.25             | 1.80             | 2.30            | 3.75            | 7.40            |
| 11  | Lifter tube.....                              | 1.20   | 1.20            | 1.40             | 1.75             | 2.50             | 4.00            | 6.00            | 9.00            |
| 12  | Forcer tube.....                              | 1.50   | 1.50            | 2.00             | 2.50             | 3.50             | 5.00            | 7.50            | 12.00           |
| 14  | Stem for overflow bonnet.....                 | .90    | .90             | 1.60             | 2.30             | 3.00             | 4.50            | 5.20            | 5.90            |
| 15  | B disk for part No. 14.....                   |        |                 |                  |                  |                  |                 | 2.30            | 3.15            |
| 15  | Handle for overflow bonnet.....               | .60    | .60             | .70              | .80              | .90              | 1.00            | 1.10            | 1.20            |
| 16  | Overflow bonnet.....                          | .80    | .80             | 1.40             | 2.00             | 2.60             | 3.30            | 4.10            | 4.70            |
| 17  | Packing nut for overflow bonnet.....          | .50    | .50             | .60              | .70              | .80              | 1.00            | 1.20            | 1.40            |
| 18  | Coupling nuts for suction and delivery.....   | .70    | .85             | 1.20             | 1.75             | 2.40             | 3.00            | 4.25            | 5.50            |
| 19  | Spanner wrench.....                           |        |                 | .80              | .90              | .90              | 1.20            | 1.40            | 1.60            |
| 21  | Nipple for suction and delivery.....          | .40    | .50             | 1.00             | 1.30             | 2.00             | 2.40            | 3.15            | 4.25            |
| 22  | Malleable iron coupling for suction.....      | .30    | .40             | .50              | .60              | .75              |                 |                 |                 |
| 23  | Malleable iron tee for delivery.....          | .30    | .40             | .50              | .80              | 1.10             | 1.55            | 2.65            | 4.55            |
| 24  | Swivel for overflow valve.....                |        |                 | .40              | .40              | .75              | 1.20            | 1.20            | 3.25            |
| 26  | Stem for overflow valve.....                  | .90    | .90             | 1.60             | 2.50             | 3.50             | 4.50            | 5.20            | 6.00            |
| 27  | Handle for overflow valve.....                | .60    | .60             | .70              | .80              | .90              | 1.00            | 1.10            | 1.20            |
| 28  | Strainer for suction pipe.....                | .40    | .50             | .70              | 1.00             | 2.50             | 3.00            |                 |                 |
| 29  | Body for overflow valve.....                  | 1.10   | 1.10            | 1.50             | 2.40             | 3.30             | 4.80            | 6.90            | 9.00            |
| 30  | Bonnet for overflow valve.....                | .90    | .90             | 1.60             | 2.50             | 3.50             | 4.50            | 5.20            | 6.00            |
| 31  | Packing nut for overflow valve.....           | .50    | .50             | .60              | .70              | .80              | 1.00            | 1.20            | 1.50            |
| 32  | Consists of parts 1, 3, 5, 8.....             | 2.95   | 2.95            | 4.50             | 6.25             | 8.30             | 10.80           | 13.20           | 16.00           |
| 33  | Consists of parts 14, 15, 16, 17.....         | 2.80   | 2.80            | 4.30             | 5.80             | 7.30             | 9.90            | 14.20           | 17.25           |
| 34  | Consists of parts 24, 26, 27, 29, 30, 31..... | 4.00   | 4.00            | 6.00             | 8.90             | 12.40            | 16.55           | 20.80           | 26.95           |
| 35  | Consists of parts 9, 10, 11, 12.....          | 4.15   | 4.15            | 5.15             | 6.40             | 9.50             | 13.55           | 20.25           | 33.90           |
| 36  | Consists of parts 18, 21, 22.....             | 1.40   | 1.75            | 2.70             | 3.65             | 5.15             | 5.40            | 7.40            | 9.75            |
| 37  | Consists of parts 18, 21, 23, 34.....         | 5.40   | 5.75            | 8.70             | 12.75            | 17.90            | 20.50           | 30.85           | 41.25           |

## BOILER TOOLS AND ATTACHMENTS

## METROPOLITAN AUTOMATIC INJECTOR

Fig. 5430



| No.   | Price   | Net weight, lbs. | Size pipe connections, inches | Gal. per hour, 80 lbs. steam pressure, 2 foot lift | Horse power |
|-------|---------|------------------|-------------------------------|----------------------------------------------------|-------------|
| 2     | \$15 00 | 2.8              | 3/8                           | 60                                                 | 4 to 6      |
| 3     | 16 00   | 2.8              | 3/8                           | 80                                                 | 6 to 8      |
| 3 1/2 | 18 00   | 3.5              | 1/2                           | 120                                                | 8 to 15     |
| 4     | 20 00   | 3.5              | 1/2                           | 165                                                | 15 to 20    |
| 5     | 25 00   | 5.5              | 3/4                           | 250                                                | 20 to 30    |
| 6     | 30 00   | 5.5              | 3/4                           | 350                                                | 30 to 45    |
| 7     | 40 00   | 8.8              | 1                             | 500                                                | 45 to 65    |
| 8     | 45 00   | 8.8              | 1                             | 600                                                | 65 to 80    |
| 9     | 55 00   | 13.1             | 1 1/4                         | 800                                                | 80 to 100   |
| 10    | 60 00   | 13.1             | 1 1/4                         | 1,000                                              | 100 to 130  |
| 11    | 75 00   | 22.2             | 1 1/2                         | 1,300                                              | 130 to 170  |
| 12    | 90 00   | 22.2             | 1 1/2                         | 1,750                                              | 170 to 230  |
| 13    | 110 00  | 31.5             | 2                             | 2,300                                              | 230 to 300  |
| 14    | 125 00  | 31.5             | 2                             | 2,850                                              | 300 to 375  |

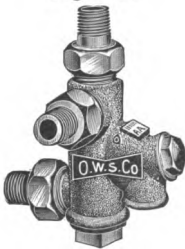
## METROPOLITAN AUTOMATIC INJECTOR PARTS

Adopted March 1, 1897

| Size of injector, No.                                   | - | - | - | - | - | 2-3    | 3 1/2-4 | 5-6    | 7-8    | 9-10   | 11-12  | 13-14  |
|---------------------------------------------------------|---|---|---|---|---|--------|---------|--------|--------|--------|--------|--------|
| S Steam jet -                                           | - | - | - | - | - | \$1 50 | \$1 75  | \$2 00 | \$2 50 | \$3 75 | \$5 00 | \$7 00 |
| V Suction jet -                                         | - | - | - | - | - | 60     | 70      | 90     | 1 25   | 1 85   | 3 00   | 4 00   |
| C R D Combining and delivery tube and auxiliary check - | - | - | - | - | - | 1 75   | 2 10    | 2 75   | 3 50   | 4 50   | 6 50   | 9 00   |
| P Overflow valve -                                      | - | - | - | - | - | 25     | 50      | 75     | 1 00   | 1 25   | 1 75   | 2 50   |
| O Steam plug -                                          | - | - | - | - | - | 1 00   | 1 25    | 1 50   | 2 25   | 3 50   | 5 00   | 7 00   |
| M Steam valve and stem -                                | - | - | - | - | - | 40     | 55      | 75     | 1 10   | 1 75   | 2 50   | 4 00   |
| N Packing nut -                                         | - | - | - | - | - | 30     | 40      | 50     | 65     | 80     | 1 00   | 1 25   |
| K Steam valve handle -                                  | - | - | - | - | - | 60     | 70      | 80     | 1 00   | 1 20   | 1 40   | 1 60   |
| A Coupling nut -                                        | - | - | - | - | - | 60     | 80      | 1 20   | 1 65   | 2 40   | 3 20   | 5 00   |
| B Tail pipe -                                           | - | - | - | - | - | 40     | 55      | 80     | 1 20   | 1 70   | 2 40   | 3 40   |
| X Overflow cap -                                        | - | - | - | - | - | 50     | 75      | 1 00   | 1 25   | 1 75   | 2 25   | 3 00   |
| E Nut for steam M -                                     | - | - | - | - | - | 10     | 10      | 10     | 15     | 15     | 15     | 20     |

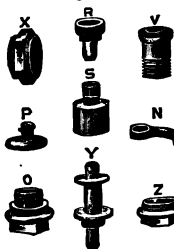
## PENBERTHY INJECTOR AND PARTS

Fig. 5422



| Size No. | Price   | Weight, lbs. | Gal. per hour, 65 lbs. pressure | Size of pipe connection | Horse power of boiler |
|----------|---------|--------------|---------------------------------|-------------------------|-----------------------|
| OO       | \$16 00 | 2.6          | 60                              | 3/8                     | 4 to 8                |
| A        | 18 00   | 3.5          | 85                              | 1/2                     | 8 to 16               |
| AA       | 20 00   | 3.5          | 120                             | 1/2                     | 12 to 22              |
| B        | 25 00   | 5.5          | 220                             | 3/4                     | 17 to 32              |
| BB       | 30 00   | 5.5          | 300                             | 3/4                     | 20 to 45              |
| C        | 40 00   | 8.0          | 430                             | 1                       | 40 to 65              |
| CC       | 45 00   | 8.0          | 540                             | 1                       | 45 to 80              |
| D        | 55 00   | 11.5         | 700                             | 1 1/4                   | 50 to 100             |
| DD       | 60 00   | 11.5         | 900                             | 1 1/4                   | 75 to 135             |
| E        | 75 00   | 20.5         | 1,260                           | 1 1/2                   | 100 to 180            |
| EE       | 90 00   | 22.0         | 1,740                           | 1 1/2                   | 115 to 255            |
| F        | 110 00  | 32.0         | 2,240                           | 2                       | 160 to 320            |
| FF       | 125 00  | 38.5         | 2,870                           | 2                       | 200 to 400            |

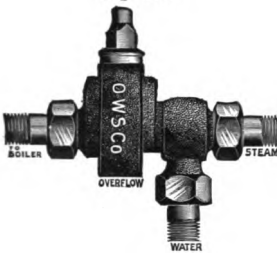
Fig. 5423



## PENBERTHY INJECTOR PARTS

| Size of Injector   | - | OO     | A or AA | B or BB | C or CC | D or DD | E      | EE     | F      | FF     |
|--------------------|---|--------|---------|---------|---------|---------|--------|--------|--------|--------|
| R Steam jet -      | - | \$0 25 | \$0 35  | \$0 45  | \$0 55  | \$0 65  | \$0 75 | \$0 75 | \$0 85 | \$1 00 |
| S Suction -        | - | 25     | 35      | 45      | 55      | 65      | 75     | 75     | 85     | 1 00   |
| Y Delivery jet -   | - | 1 25   | 1 50    | 2 00    | 2 50    | 3 00    | 3 75   | 4 50   | 5 50   | 6 50   |
| X Coupling nut -   | - | 25     | 30      | 40      | 50      | 60      | 1 25   | 1 25   | 1 50   | 1 50   |
| V Tail pipe -      | - | 25     | 30      | 40      | 50      | 60      | 80     | 80     | 1 00   | 1 00   |
| Z Overflow cap -   | - | 30     | 40      | 50      | 60      | 70      | 80     | 80     | 90     | 90     |
| P Overflow valve - | - | 40     | 50      | 60      | 75      | 90      | 1 00   | 1 10   | 1 25   | 1 25   |
| N Overflow hinge - | - | 10     | 10      | 15      | 15      | 15      | 20     | 20     | 20     | 20     |
| O Plug -           | - | 60     | 80      | 1 00    | 1 25    | 1 50    | 1 75   | 1 75   | 2 00   | 2 00   |
| Strainer -         | - | 40     | 40      | 50      | 50      | 60      | 75     | 75     | 1 00   | 1 00   |

Fig. 5424



## BOILER TOOLS AND ATTACHMENTS

## NATIONAL AUTOMATIC INJECTOR

| No. | Price   | SIZES OF PIPE CONNECTIONS |                |                | Gallons per hour<br>at<br>60 lb. pressure | Horse power |
|-----|---------|---------------------------|----------------|----------------|-------------------------------------------|-------------|
|     |         | Steam                     | Supply         | Delivery       |                                           |             |
| 00  | \$16 00 | $\frac{3}{8}$             | $\frac{3}{8}$  | $\frac{3}{8}$  | 60                                        | 1 to 5      |
| 0   | 18 00   | $\frac{3}{8}$             | $\frac{3}{8}$  | $\frac{3}{8}$  | 90                                        | 5 to 10     |
| 1   | 20 00   | $\frac{1}{2}$             | $\frac{1}{2}$  | $\frac{1}{2}$  | 120                                       | 10 to 15    |
| 2   | 25 00   | $\frac{1}{2}$             | $\frac{3}{4}$  | $\frac{3}{4}$  | 220                                       | 15 to 24    |
| 3   | 30 00   | $\frac{1}{2}$             | $\frac{3}{4}$  | $\frac{3}{4}$  | 300                                       | 24 to 35    |
| 4   | 40 00   | $\frac{3}{4}$             | 1              | 1              | 420                                       | 35 to 50    |
| 5   | 45 00   | $\frac{3}{4}$             | 1              | 1              | 540                                       | 50 to 65    |
| 6   | 55 00   | 1                         | $1\frac{1}{4}$ | $1\frac{1}{4}$ | 720                                       | 65 to 90    |
| 7   | 60 00   | 1                         | $1\frac{1}{4}$ | $1\frac{1}{4}$ | 900                                       | 90 to 115   |
| 8   | 75 00   | $1\frac{1}{4}$            | $1\frac{1}{4}$ | $1\frac{1}{4}$ | 1,200                                     | 115 to 150  |
| 9   | 90 00   | $1\frac{1}{4}$            | $1\frac{1}{2}$ | $1\frac{1}{2}$ | 1,700                                     | 150 to 200  |
| 10  | 110 00  | $1\frac{1}{2}$            | 2              | 2              | 2,200                                     | 200 to 275  |
| 11  | 125 00  | $1\frac{1}{2}$            | 2              | 2              | 2,800                                     | 275 to 350  |

## NATIONAL AUTOMATIC INJECTOR PARTS

| No. pts. | Size of Injector by No.                      | 00     | 0  | 1  | 2  | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   |
|----------|----------------------------------------------|--------|----|----|----|------|------|------|------|------|------|------|------|------|
| 1        | Delivery tube - - - -                        | \$0 50 | 55 | 60 | 65 | 70   | 75   | 80   | 1 00 | 1 10 | 1 30 | 1 40 | 1 70 | 1 80 |
| 2        | Combining tube - - - -                       | 75     | 80 | 85 | 90 | 1 00 | 1 20 | 1 40 | 1 70 | 1 80 | 2 10 | 2 20 | 2 50 | 2 70 |
| 3        | Lifting tube - - - -                         | 50     | 55 | 60 | 65 | 70   | 75   | 80   | 1 00 | 1 10 | 1 30 | 1 40 | 1 70 | 1 80 |
| 4        | Steam jet - - - -                            | 50     | 55 | 60 | 65 | 70   | 75   | 80   | 1 00 | 1 10 | 1 30 | 1 40 | 1 70 | 1 80 |
| 5        | Immediate cut-off - - -                      | 40     | 45 | 50 | 55 | 60   | 65   | 70   | 80   | 90   | 1 00 | 1 10 | 2 01 | 30   |
| 6        | Overflow check - - - -                       | 50     | 55 | 60 | 65 | 70   | 75   | 80   | 1 00 | 1 10 | 1 30 | 1 40 | 1 70 | 1 80 |
| 7        | Overflow cap - - - -                         | 50     | 55 | 60 | 65 | 70   | 75   | 80   | 1 00 | 1 10 | 1 30 | 1 40 | 1 70 | 1 80 |
| 8        | Nut and tail piece for steam end - - - -     | 60     | 65 | 70 | 70 | 70   | 80   | 80   | 90   | 90   | 1 10 | 1 10 | 1 50 | 1 50 |
| 9        | Nut and tail piece for discharge end - - - - | 60     | 65 | 70 | 80 | 80   | 90   | 90   | 1 10 | 1 10 | 1 50 | 1 50 | 2 00 | 2 00 |
| 10       | Nut and tail piece for water end - - - -     | 60     | 65 | 70 | 80 | 80   | 90   | 90   | 1 10 | 1 10 | 1 50 | 1 50 | 2 00 | 2 00 |

Fig. 5451



## H. D. EJECTOR OR JET PUMP

| Size                | Price  | Net weight, lbs. | PIPE CONNECTIONS |                            | Capacity per hour, gallons | Strainers each |
|---------------------|--------|------------------|------------------|----------------------------|----------------------------|----------------|
|                     |        |                  | Steam, inch      | Suction and delivery, inch |                            |                |
| No. 1 brass - - - - | \$8 00 | 1.2              | $\frac{3}{8}$    | $\frac{1}{2}$              | 250                        | \$0 30         |
| No. 2 brass - - - - | 10 00  | 1.7              | $\frac{1}{2}$    | $\frac{3}{4}$              | 500                        | 40             |
| No. 3 brass - - - - | 15 00  | 2.7              | $\frac{3}{4}$    | 1                          | 960                        | 50             |
| No. 4 brass - - - - | 20 00  | 4.0              | 1                | $1\frac{1}{4}$             | 1,300                      | 60             |
| No. 5 brass - - - - | 25 00  | 5.8              | $1\frac{1}{4}$   | $1\frac{1}{2}$             | 2,000                      | 80             |
| No. 6 iron - - - -  | 35 00  | 9.7              | $1\frac{1}{4}$   | 2                          | 4,000                      | 1 00           |
| No. 7 iron - - - -  | 45 00  | - - -            | $1\frac{1}{2}$   | $2\frac{1}{2}$             | 8,000                      | 1 25           |
| No. 8 iron - - - -  | 55 00  | 22.6             | 2                | 3                          | 11,000                     | 1 75           |
| No. 9 iron - - - -  | 70 00  | 39.5             | $2\frac{1}{2}$   | 4                          | 15,000                     | 2 50           |

# BOILER TOOLS AND ATTACHMENTS

Fig. 4780



Fig. 4781



## LOW WATER ALARMS

To be placed at second gauge cock in boiler.

When water is below that point steam enters and expands tube, which drops weight and blows the whistle.

Fig. 4780 (O. W. S. Co.) less whistle - - - - - \$2 50  
 Fig. 4781 (Evans) less whistle - - - - - 3 00

## LUTHER LOW WATER SHUT-OFF

Not illustrated.

| Size - - - - - inches | 1      | 1½   | 2     |
|-----------------------|--------|------|-------|
| Price - - - - -       | \$5 00 | 8 00 | 12 00 |

Fig. 4800



## BLEEDERS FOR STEAM PIPES

ALSO CALLED DRAIN PLUGS

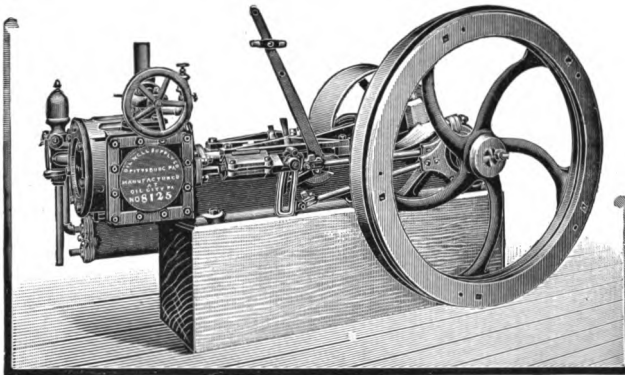
| Sizes - - - - - inches       | 1      | 1½   | 1½   | 2    |
|------------------------------|--------|------|------|------|
| Single thread, fig. 4800 - - | \$0 90 | 1 00 | 1 10 | 1 25 |
| Double thread, fig. 4801 - - | 1 20   | 1 25 | 1 50 | 2 00 |

Fig. 4801



**"LINK" ENGINE****DOUBLE ECCENTRIC**

The highest grade and most efficient engine for well drilling

**Fig. 1425**

Slide valve. Reversed by a rod in the derrick.

**TABLE OF DIMENSIONS AND POWER OF DRILLING ENGINES**

|                            |   |   |   |   |   |          |        |        |        |        |
|----------------------------|---|---|---|---|---|----------|--------|--------|--------|--------|
| Horse power                | - | - | - | - | - | 12       | 13½    | 15     | 18     | 20     |
| Revolutions per minute     | - | - | - | - | - | 175      | 175    | 175    | 175    | 150    |
| Diameter of cylinder       | - | - | - | - | - | 8        | 8½     | 9      | 9½     | 10     |
| Length of stroke           | - | - | - | - | - | 12       | 12     | 12     | 12     | 12     |
| Diameter of steam pipe     | - | - | - | - | - | 2        | 2      | 2      | 2      | 2      |
| Diameter of exhaust pipe   | - | - | - | - | - | 4¼       | 4¼     | 4¼     | 4¼     | 4¼     |
| Diameter of pulley         | - | - | - | - | - | 30       | 30     | 30     | 30     | 30     |
| Diameter of balance wheel  | - | - | - | - | - | 50       | 50     | 56     | 56     | 60     |
| Diameter of crank shaft    | - | - | - | - | - | 3¼       | 3¼     | 3¼     | 3¼     | 3¼     |
| Diameter of crank pin      | - | - | - | - | - | 3¼       | 3¼     | 3¼     | 3¼     | 3¼     |
| Diameter of cross head pin | - | - | - | - | - | 2¼       | 2¼     | 2¼     | 2¼     | 2¼     |
| Width of engine block      | - | - | - | - | - | 22       | 22     | 22     | 22     | 24     |
| Length of engine block     | - | - | - | - | - | 72       | 72     | 72     | 72     | 72     |
| Weight, complete           | - | - | - | - | - | 2800     | 2800   | 3300   | 3300   | 4000   |
| Weight, complete           | - | - | - | - | - | 1273     | 1273   | 1500   | 1500   | 1818   |
| Complete engine            | - | - | - | - | - | \$285 00 | 290 00 | 295 00 | 305 00 | 320 00 |
| Stripped engine            | - | - | - | - | - | 267 50   | 272 50 | 277 50 | 287 50 | 302 50 |

|                            |   |   |   |   |   |        |        |        |        |      |
|----------------------------|---|---|---|---|---|--------|--------|--------|--------|------|
| Horse power                | - | - | - | - | - | 23     | 25     | 28     | 30     | 70   |
| Revolutions per minute     | - | - | - | - | - | 150    | 150    | 150    | 150    | 125  |
| Diameter of cylinder       | - | - | - | - | - | 10½    | 11     | 11½    | 12     | 16   |
| Length of stroke           | - | - | - | - | - | 12     | 12     | 12     | 12     | 16   |
| Diameter of steam pipe     | - | - | - | - | - | 2      | 2      | 2      | 2½     | 4    |
| Diameter of exhaust pipe   | - | - | - | - | - | 4¼     | 4¼     | 4¼     | 4¼     | 5½   |
| Diameter of pulley         | - | - | - | - | - | 30     | 26     | 26     | 26     | -    |
| Diameter of balance wheel  | - | - | - | - | - | 60     | 60     | 60     | 60     | -    |
| Diameter of crank shaft    | - | - | - | - | - | 3¼     | 4      | 4      | 4      | 5    |
| Diameter of crank pin      | - | - | - | - | - | 3¼     | 4      | 4      | 4      | 5    |
| Diameter of cross head pin | - | - | - | - | - | 2¼     | 2¼     | 2¼     | 2¼     | 3¼   |
| Width of engine block      | - | - | - | - | - | 24     | 24     | 24     | 24     | 28½  |
| Length of engine block     | - | - | - | - | - | 72     | 72     | 72     | 74     | 100  |
| Weight, complete           | - | - | - | - | - | 3900   | 4500   | 4600   | 4600   | 4700 |
| Weight, complete           | - | - | - | - | - | 1773   | 2045   | 2090   | 2090   | 2136 |
| Complete engine            | - | - | - | - | - | 330 00 | 340 00 | 365 00 | 375 00 | -    |
| Stripped engine            | - | - | - | - | - | 312 50 | 317 50 | 342 50 | 352 50 | -    |

The above given weights of 16 x 16 engines are less pump, heater, and fly wheel.

The "complete" engine includes pulley, balance wheel, extra rims, throttle valve, lubricator, oil cups, pet cocks, foundation bolts, and wrenches, but does not include any connecting pipes between engine and boiler, these are subject to order and are charged extra.

The "stripped" engine includes fixtures same as above specified, except the pump, heater, and extra rims.

In ordering, specify whether a "complete" or "stripped" engine is wanted.



## PARTS FOR "LINK" ENGINE

When ordering parts, state size and number of engine.

Fig. 3910



Fig. 3911



Fig. 3912



Fig. 3916



Fig. 3917



Fig. 3913



Fig. 3914



Fig. 3915



Fig. 3918



Fig. 3921



Fig. 4089



Fig. 3920



Fig. 3923

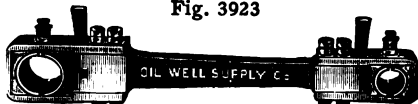


Fig. 3924



Fig. 3925



Fig. 3926

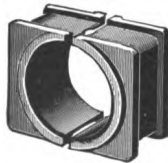


Fig. 3927



Fig. 3928

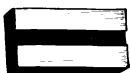


Fig. 3929



Fig. 3930



Fig. 3931



Fig. 3932



Fig. 3933



Fig. 3934



Fig. 3935



Fig. 3940



## PARTS FOR "LINK" ENGINE

When ordering parts, state size and number of engine

Fig. 3943

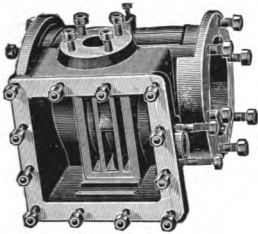


Fig. 3949



Fig. 3953



Fig. 3960

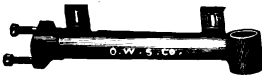


Fig. 3964



Fig. 3970



Fig. 3981



Fig. 3986



Fig. 3944



Fig. 3950



Fig. 3955

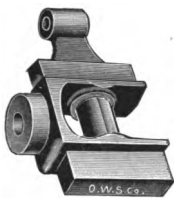


Fig. 3961



Fig. 3966



Fig. 3974



Fig. 3982

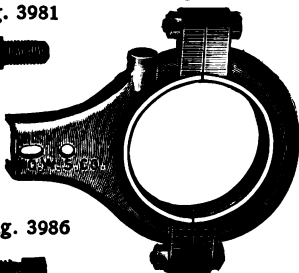


Fig. 3944

Fig. 3945



Fig. 3951



Fig. 3958



Fig. 3946



Fig. 3948



Fig. 3947



Fig. 3952



Fig. 3959



Fig. 3963



Fig. 3968



Fig. 3969



Fig. 3962



Fig. 3967



Fig. 3973

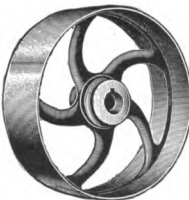


Fig. 3977



Fig. 3980



Fig. 3987

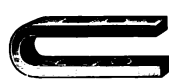


Fig. 3983



Fig. 3991



Fig. 3988



Fig. 3984



Fig. 3989

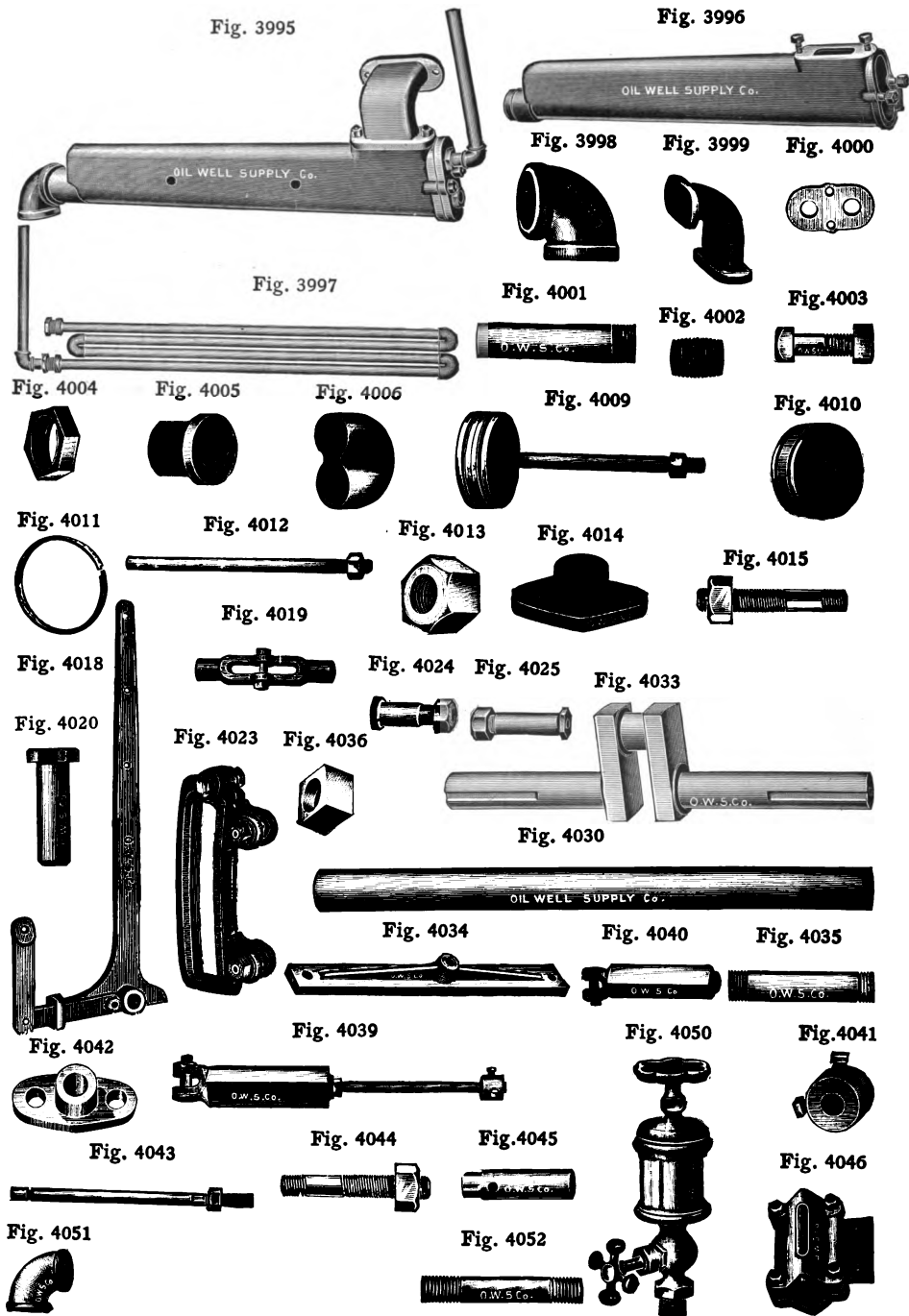


Fig. 3990



## PARTS FOR "LINK" ENGINE

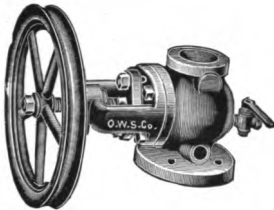
When ordering parts, state size and number of engine



## PARTS FOR "LINK" ENGINE

**When ordering parts, state size and number of engine**

**Fig. 4057**



**Fig. 4058**



**Fig. 4059**



**Fig. 4060**



**Fig. 4061**



**Fig. 4066**



**Fig. 4064**



**Fig. 4065**



**Fig. 4062**



**Fig. 4063**



**Fig. 4068**



**Fig. 4069**



**Fig. 4070**



**Fig. 4075**



**Fig. 4067**



### PARTS FOR "LINK" ENGINE—LIST

[illegible]



**When ordering parts, state size and number of engine**

| Figure No. | PARTS                                            | SIZES OF ENGINES |            |        |            |         |             |         |             |         |  |
|------------|--------------------------------------------------|------------------|------------|--------|------------|---------|-------------|---------|-------------|---------|--|
|            |                                                  | 8 x 12           | 8 1/2 x 12 | 9 x 12 | 9 1/2 x 12 | 10 x 12 | 10 1/2 x 12 | 11 x 12 | 11 1/2 x 12 | 12 x 12 |  |
| 4003       | Heater bolt - - - - -                            | \$0 10           | 10         | 10     | 10         | 10      | 10          | 10      | 10          | 10      |  |
| 4004       | Heater lock-nut - - - - -                        | 10               | 10         | 10     | 10         | 10      | 10          | 10      | 10          | 10      |  |
| 4005       | Heater collar - - - - -                          | 30               | 30         | 30     | 30         | 30      | 30          | 30      | 30          | 30      |  |
| 4006       | Heater return bend - - - - -                     | 25               | 25         | 25     | 25         | 25      | 25          | 25      | 25          | 25      |  |
| 4009       | Piston, complete - - - - -                       | 6 50             | 6 75       | 7 00   | 7 25       | 8 25    | 8 75        | 9 75    | 10 00       | 11 00   |  |
| 4010       | Piston head - - - - -                            | 3 75             | 4 00       | 4 50   | 4 50       | 5 25    | 5 75        | 6 00    | 6 50        | 8 25    |  |
| 4011       | Piston ring (two in a set) - - - - -             | 1 00             | 1 00       | 1 00   | 1 00       | 1 15    | 1 15        | 1 25    | 1 25        | 1 25    |  |
| 4012       | Piston rod and nut - - - - -                     | 2 75             | 2 75       | 2 75   | 2 75       | 3 00    | 3 00        | 3 75    | 3 75        | 3 75    |  |
| 4013       | Piston nut - - - - -                             | 50               | 50         | 50     | 50         | 50      | 50          | 50      | 50          | 50      |  |
| 4014       | Piston gland - - - - -                           | 50               | 50         | 50     | 50         | 50      | 50          | 50      | 50          | 50      |  |
| 4015       | Piston gland stud and nut - - - - -              | 15               | 15         | 15     | 15         | 15      | 15          | 15      | 15          | 15      |  |
| 4018       | Reverse lever, complete - - - - -                | 4 50             | 4 50       | 4 50   | 4 50       | 4 50    | 4 50        | 4 50    | 4 50        | 4 50    |  |
| 4019       | Reverse lever yoke - - - - -                     | 50               | 50         | 50     | 50         | 50      | 50          | 50      | 50          | 50      |  |
| 4020       | Reverse lever fulcrum pin - - - - -              | 60               | 60         | 60     | 60         | 60      | 60          | 60      | 60          | 60      |  |
| 4023       | Link complete - - - - -                          | 6 00             | 6 00       | 6 00   | 6 00       | 6 00    | 6 00        | 6 00    | 6 00        | 6 00    |  |
| 4024       | Link ear pin and nut - - - - -                   | 50               | 50         | 50     | 50         | 50      | 50          | 50      | 50          | 50      |  |
| 4025       | Link hanger bolt and nut - - - - -               | 50               | 50         | 50     | 50         | 50      | 50          | 50      | 50          | 50      |  |
| 4030       | Exhaust pipe - - - - -                           | 2 80             | 2 80       | 2 80   | 2 80       | 2 80    | 2 80        | 2 80    | 2 80        | 2 80    |  |
| 4033       | Shaft - - - - -                                  | 30 50            | 30 50      | 33 00  | 33 00      | 36 25   | 36 25       | 44 00   | 44 00       | 44 00   |  |
| 4034       | Guide - - - - -                                  | 1 25             | 1 25       | 1 25   | 1 25       | 2 00    | 2 00        | 2 25    | 2 25        | 2 25    |  |
| 4035       | Guide stud - - - - -                             | 20               | 20         | 20     | 20         | 20      | 20          | 20      | 20          | 20      |  |
| 4036       | Guide block - - - - -                            | 15               | 15         | 15     | 15         | 15      | 15          | 15      | 15          | 15      |  |
| 4039       | Valve rod and slide, complete - - - - -          | 6 00             | 6 00       | 6 00   | 6 00       | 6 00    | 6 00        | 6 00    | 6 00        | 6 00    |  |
| 4040       | Valve rod slide - - - - -                        | 4 00             | 4 00       | 4 00   | 4 00       | 4 00    | 4 00        | 4 00    | 4 00        | 4 00    |  |
| 4041       | Valve rod collar - - - - -                       | 50               | 50         | 50     | 50         | 50      | 50          | 50      | 50          | 50      |  |
| 4042       | Valve rod gland - - - - -                        | 50               | 50         | 50     | 50         | 50      | 50          | 50      | 50          | 50      |  |
| 4043       | Valve rod and nut - - - - -                      | 1 00             | 1 00       | 1 00   | 1 00       | 1 00    | 1 00        | 1 00    | 1 00        | 1 00    |  |
| 4044       | Valve rod gland stud and nut - - - - -           | 10               | 10         | 10     | 10         | 10      | 10          | 10      | 10          | 10      |  |
| 4045       | Valve rod slide pin - - - - -                    | 50               | 50         | 50     | 50         | 50      | 50          | 50      | 50          | 50      |  |
| 4046       | Slide bracket - - - - -                          | 4 25             | 4 25       | 4 25   | 4 25       | 4 25    | 4 25        | 4 25    | 4 25        | 4 25    |  |
| 4050       | Lubricator - - - - -                             | 60               | 60         | 60     | 60         | 60      | 60          | 60      | 60          | 60      |  |
| 4051       | Lubricator elbow - - - - -                       | 05               | 05         | 05     | 05         | 05      | 05          | 05      | 05          | 05      |  |
| 4052       | Lubricator nipple - - - - -                      | 10               | 10         | 10     | 10         | 10      | 10          | 10      | 10          | 10      |  |
| 4057       | Throttle valve, complete - - - - -               | 9 50             | 9 50       | 9 50   | 9 50       | 10 00   | 10 00       | 10 75   | 10 75       | 10 75   |  |
| 4058       | Throttle valve body - - - - -                    | 3 00             | 3 00       | 3 00   | 3 00       | 3 50    | 3 50        | 3 75    | 3 75        | 3 75    |  |
| 4059       | Throttle valve yoke - - - - -                    | 2 00             | 2 00       | 2 00   | 2 00       | 2 00    | 2 00        | 2 00    | 2 00        | 2 00    |  |
| 4060       | Throttle valve yoke nut (brass) - - - - -        | 1 00             | 1 00       | 1 00   | 1 00       | 1 00    | 1 00        | 1 00    | 1 00        | 1 00    |  |
| 4061       | Throttle valve yoke stud and nut - - - - -       | 10               | 10         | 10     | 10         | 10      | 10          | 10      | 10          | 10      |  |
| 4062       | Throttle valve nut - - - - -                     | 10               | 10         | 10     | 10         | 10      | 10          | 10      | 10          | 10      |  |
| 4063       | Throttle valve stem - - - - -                    | 1 00             | 1 00       | 1 00   | 1 00       | 1 00    | 1 00        | 1 00    | 1 00        | 1 00    |  |
| 4064       | Throttle valve clapper - - - - -                 | 65               | 65         | 65     | 65         | 65      | 65          | 65      | 65          | 65      |  |
| 4065       | Throttle valve seat - - - - -                    | 75               | 75         | 75     | 75         | 75      | 75          | 75      | 75          | 75      |  |
| 4066       | Throttle valve wheel - - - - -                   | 50               | 50         | 50     | 50         | 50      | 50          | 50      | 50          | 50      |  |
| 4067       | Throttle valve set screw - - - - -               | 10               | 10         | 10     | 10         | 10      | 10          | 10      | 10          | 10      |  |
| 4068       | Throttle valve stem gland - - - - -              | 35               | 35         | 35     | 35         | 35      | 35          | 35      | 35          | 35      |  |
| 4069       | Throttle valve stem gland stud and nut - - - - - | 10               | 10         | 10     | 10         | 10      | 10          | 10      | 10          | 10      |  |
| 4070       | Throttle valve and steam chest stud - - - - -    | 10               | 10         | 10     | 10         | 10      | 10          | 10      | 10          | 10      |  |
| 4075       | Malleable iron wrench - - - - -                  | 25               | 25         | 25     | 25         | 25      | 25          | 25      | 25          | 25      |  |

## PARTS OF SINGLE ECCENTRIC ENGINE

WOOLF'S PATENT

When ordering parts, state size and number of engine

Fig. 3745



Fig. 3747



Fig. 3748



Fig. 3750 Fig. 3751



Fig. 3752



Fig. 3753



Fig. 3749



Fig. 3759



Fig. 3758

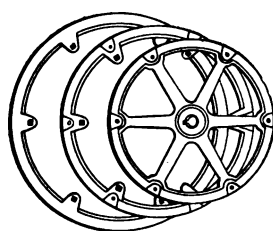


Fig. 3757

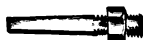


Fig. 3754



Fig. 3760



Fig. 3761



Fig. 3762



Fig. 3763

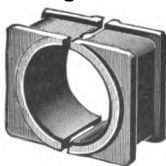


Fig. 3764



Fig. 3765



Fig. 3766



Fig. 3767



Fig. 3768



Fig. 3771



Fig. 3772



Fig. 3769



Fig. 3770



Fig. 3774



## PARTS OF SINGLE ECCENTRIC ENGINE

Fig. 3778 When ordering parts, state size and number of engine

Fig. 3779

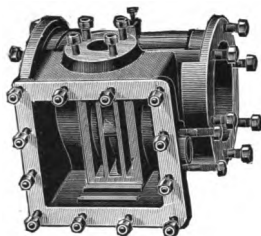


Fig. 3780

Fig. 3776



Fig. 3881



Fig. 3777



Fig. 3783



Fig. 3784



Fig. 3782



Fig. 3787

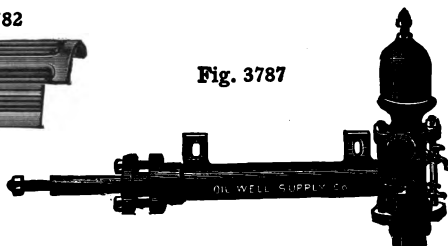


Fig. 3789



Fig. 3788



Fig. 3790



Fig. 3791



Fig. 3792



Fig. 3793



Fig. 3798



Fig. 3796



Fig. 3794



Fig. 3795



Fig. 3797



Fig. 3800



Fig. 3805

Fig. 3806



Fig. 3804



Fig. 3807



Fig. 3803



Fig. 3808



Fig. 3799



Fig. 3812



Fig. 3814



Fig. 3810



Fig. 3811



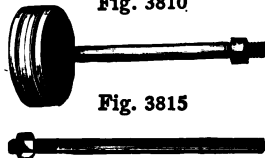
Fig. 3813



Fig. 3816



Fig. 3815





## PARTS OF SINGLE ECCENTRIC ENGINE

When ordering parts, state size and number of engine

Fig. 3819



Fig. 3837



Fig. 3838



Fig. 3820



Fig. 3830



Fig. 3835



Fig. 3839



Fig. 3822



Fig. 3829



Fig. 3832

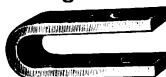


Fig. 3824



Fig. 3833



Fig. 3834

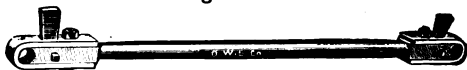


Fig. 3836



Fig. 3844



Fig. 3841



Fig. 3843

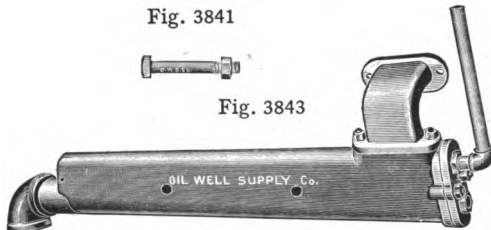


Fig. 3845

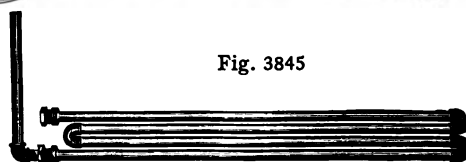


Fig. 3846



Fig. 3847



Fig. 3848



Fig. 3849



Fig. 3851



Fig. 3852



Fig. 3853



Fig. 3854



Fig. 3855



Fig. 3860

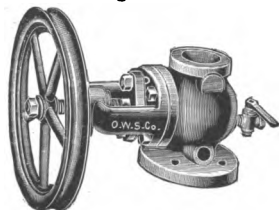


Fig. 3861

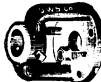


Fig. 3864



Fig. 3862



Fig. 3865



Fig. 3856



Fig. 3863



Fig. 3858



## PARTS OF SINGLE ECCENTRIC ENGINE

When ordering parts, state size and number of engine

Fig. 3866



Fig. 3867



Fig. 3868



Fig. 3870



Fig. 3869



Fig. 3874

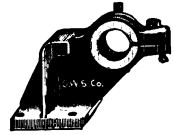


Fig. 3873



Fig. 3875



Fig. 3876



Fig. 3877



Fig. 3878



Fig. 3879



Fig. 3880



Fig. 3881



Fig. 3882



Fig. 3884



Fig. 3890



Fig. 3886



Fig. 3888



Fig. 3891



Fig. 3887



Fig. 3893



Fig. 3894



Fig. 3895



Fig. 3903



Fig. 3896



Fig. 3898



Fig. 3897



Fig. 3901



Fig. 3900



For price of all sizes of pulleys, see p.102

Fig. 3905





## PARTS OF SINGLE ECCENTRIC ENGINE

## WOOLF'S PATENT

**When ordering parts, state size and number of engine**

## LIST

| Figure No. | PARTS                                                      | SIZES OF ENGINES |         |        |         |         |          |         |          |         |
|------------|------------------------------------------------------------|------------------|---------|--------|---------|---------|----------|---------|----------|---------|
|            |                                                            | 8 x 12           | 8½ x 12 | 9 x 12 | 9½ x 12 | 10 x 12 | 10½ x 12 | 11 x 12 | 11½ x 12 | 12 x 12 |
| 3792       | Air cock, bib nozzle - - -                                 | \$0 45           | 45      | 45     | 45      | 45      | 45       | 45      | 45       | 45      |
| 3793       | Pump gland - - - - -                                       | 50               | 50      | 50     | 50      | 50      | 50       | 50      | 50       | 50      |
| 3794       | Pump valve and seat, bottom                                | 2 00             | 2 00    | 2 00   | 2 00    | 2 00    | 2 00     | 2 00    | 2 00     | 2 00    |
| 3795       | Pump valve and seat, top                                   | 2 00             | 2 00    | 2 00   | 2 00    | 2 00    | 2 00     | 2 00    | 2 00     | 2 00    |
| 3796       | Pump connect. bolt and nut                                 | 10               | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3797       | Pump base - - - - -                                        | 65               | 65      | 65     | 65      | 65      | 65       | 65      | 65       | 65      |
| 3798       | Pump gland stud and nut                                    | 20               | 20      | 20     | 20      | 20      | 20       | 20      | 20       | 20      |
| 3799       | Pump union elbow - - -                                     | 65               | 65      | 65     | 65      | 65      | 65       | 65      | 65       | 65      |
| 3800       | Pump plunger and nut                                       | 2 00             | 2 00    | 2 00   | 2 00    | 2 00    | 2 00     | 2 00    | 2 00     | 2 00    |
| 3803       | Heater cellar - - - - -                                    | 25               | 25      | 25     | 25      | 25      | 25       | 25      | 25       | 25      |
| 3804       | Heater stud - - - - -                                      | 15               | 15      | 15     | 15      | 15      | 15       | 15      | 15       | 15      |
| 3805       | Heater lock nut - - - -                                    | 15               | 15      | 15     | 15      | 15      | 15       | 15      | 15       | 15      |
| 3806       | Heater union nipple - - -                                  | 25               | 25      | 25     | 25      | 25      | 25       | 25      | 25       | 25      |
| 3807       | Heater return bend - - -                                   | 25               | 25      | 25     | 25      | 25      | 25       | 25      | 25       | 25      |
| 3808       | Heater nipple - - - - -                                    | 10               | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3810       | Piston head and rod - - -                                  | 6 50             | 6 75    | 7 00   | 7 25    | 8 25    | 8 75     | 9 75    | 10 00    | 11 00   |
| 3811       | Piston ring (two in a set) -                               | 1 00             | 1 00    | 1 00   | 1 00    | 1 15    | 1 15     | 1 25    | 1 25     | 1 25    |
| 3812       | Piston gland - - - - -                                     | 50               | 50      | 50     | 50      | 65      | 65       | 65      | 65       | 65      |
| 3813       | Piston gland stud and nut                                  | 15               | 15      | 15     | 15      | 15      | 15       | 15      | 15       | 15      |
| 3814       | Piston head - - - - -                                      | 3 75             | 4 00    | 4 50   | 4 50    | 5 25    | 5 75     | 6 00    | 6 50     | 8 25    |
| 3815       | Piston rod and nut - - -                                   | 2 75             | 2 75    | 2 75   | 2 75    | 3 00    | 3 00     | 3 75    | 3 75     | 3 75    |
| 3816       | Piston nut - - - - -                                       | 50               | 50      | 50     | 50      | 50      | 50       | 50      | 50       | 50      |
| 3819       | Eccentric strap - - - - -                                  | 6 50             | 6 50    | 6 50   | 6 50    | 6 75    | 6 75     | 6 75    | 6 75     | 6 75    |
| 3820       | Eccentric hub and set screw                                | 3 25             | 3 25    | 3 25   | 3 25    | 4 00    | 4 00     | 4 00    | 4 00     | 4 00    |
| 3822       | Exhaust flange, stripped                                   | 2 00             | 2 00    | 2 00   | 2 00    | 2 00    | 2 00     | 2 00    | 2 00     | 2 00    |
| 3824       | Cross head - - - - -                                       | 5 00             | 5 00    | 5 00   | 5 00    | 6 25    | 6 25     | 7 75    | 7 75     | 7 75    |
| 3826       | Eccentric strap bolt - - -                                 | 40               | 40      | 40     | 40      | 40      | 40       | 40      | 40       | 40      |
| 3828       | Eccentric key - - - - -                                    | 35               | 35      | 35     | 35      | 35      | 35       | 35      | 35       | 35      |
| 3829       | Eccentric strap pin - - -                                  | 65               | 65      | 65     | 65      | 65      | 65       | 65      | 65       | 65      |
| 3830       | Eccentric strap set screw                                  | 10               | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3831       | Eccentric rod strap bolt                                   | 40               | 40      | 40     | 40      | 40      | 40       | 40      | 40       | 40      |
| 3832       | Eccentric rod strap, ecc. end                              | 1 25             | 1 25    | 1 25   | 1 25    | 1 25    | 1 25     | 1 25    | 1 25     | 1 25    |
| 3833       | Eccentric rod strap, valve end                             | 1 15             | 1 15    | 1 15   | 1 15    | 1 15    | 1 15     | 1 15    | 1 15     | 1 15    |
| 3834       | Eccentric rod, complete - -                                | 8 00             | 8 00    | 8 00   | 8 00    | 8 00    | 8 00     | 8 00    | 8 00     | 8 00    |
| 3835       | Eccentric rod brass - - -                                  | 40               | 40      | 40     | 40      | 40      | 40       | 40      | 40       | 40      |
| 3836       | Eccentric rod, stripped                                    | - - -            | - - -   | - - -  | - - -   | - - -   | - - -    | - - -   | - - -    | - - -   |
| 3837       | Eccentric rod key - - - -                                  | 40               | 40      | 40     | 40      | 40      | 40       | 40      | 40       | 40      |
| 3838       | Eccentric rod set screw, ecc.<br>end - - - - -             | 10               | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3839       | Eccentric rod set screw, valve<br>end - - - - -            | 10               | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3841       | Valve rod head pin bolt and<br>revers. rol. pin bolt - - - | 10               | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3843       | Heater, complete - - - -                                   | 21 00            | 21 00   | 21 00  | 21 00   | 21 00   | 21 00    | 21 00   | 21 00    | 21 00   |
| 3844       | Heater case - - - - -                                      | 11 75            | 11 75   | 11 75  | 11 75   | 11 75   | 11 75    | 11 75   | 11 75    | 11 75   |
| 3845       | Heater pipes, complete - -                                 | 3 25             | 3 25    | 3 25   | 3 25    | 3 25    | 3 25     | 3 25    | 3 25     | 3 25    |
| 3846       | Heater elbow - - - - -                                     | 80               | 80      | 80     | 80      | 1 10    | 1 10     | 1 10    | 1 10     | 1 10    |
| 3847       | Heater goose neck - - - -                                  | 2 75             | 2 75    | 2 75   | 2 75    | 2 75    | 2 75     | 2 75    | 2 75     | 2 75    |
| 3848       | Heater head - - - - -                                      | 65               | 65      | 65     | 65      | 65      | 65       | 65      | 65       | 65      |

## PARTS OF SINGLE ECCENTRIC ENGINE

## WOOLF'S PATENT

**When ordering parts, state size and number of engine**

## LIST

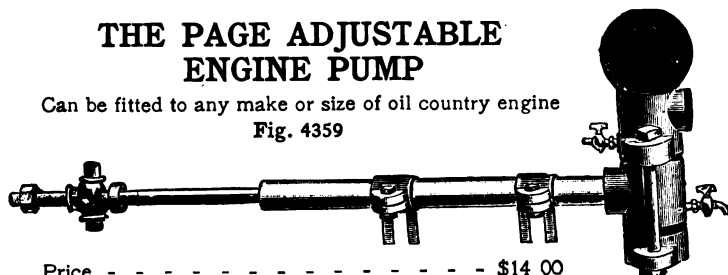
| Figure No. | PARTS                                            | SIZE OF ENGINES |         |        |         |         |          |         |          |         |
|------------|--------------------------------------------------|-----------------|---------|--------|---------|---------|----------|---------|----------|---------|
|            |                                                  | 8 x 12          | 8½ x 12 | 9 x 12 | 9½ x 12 | 10 x 12 | 10½ x 12 | 11 x 12 | 11½ x 12 | 12 x 12 |
| 3849       | Heater bolt - - - - -                            | \$0 10          | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3851       | Valve rod collar - - - - -                       | 50              | 50      | 50     | 50      | 50      | 50       | 50      | 50       | 50      |
| 3852       | Valve rod gland - - - - -                        | 50              | 50      | 50     | 50      | 50      | 50       | 50      | 50       | 50      |
| 3853       | Valve rod gland stud and nut -                   | 10              | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3854       | Valve rod slide - - - - -                        | 4 00            | 4 00    | 4 00   | 4 00    | 4 00    | 4 00     | 4 00    | 4 00     | 4 00    |
| 3855       | Valve rod slide pin - - - - -                    | 50              | 50      | 50     | 50      | 50      | 50       | 50      | 50       | 50      |
| 3856       | Slide bracket - - - - -                          | 4 25            | 4 25    | 4 25   | 4 25    | 4 25    | 4 25     | 4 25    | 4 25     | 4 25    |
| 3858       | Slide valve - - - - -                            | 2 25            | 2 25    | 2 25   | 2 25    | 2 75    | 2 75     | 3 25    | 3 25     | 3 25    |
| 3860       | Throttle valve, complete - - -                   | 9 50            | 9 50    | 9 50   | 9 50    | 10 00   | 10 00    | 10 75   | 10 75    | 10 75   |
| 3861       | Throttle valve yoke - - - - -                    | 2 00            | 2 00    | 2 00   | 2 00    | 2 00    | 2 00     | 2 00    | 2 00     | 2 00    |
| 3862       | Throttle valve set screw - - -                   | 10              | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3863       | Throttle valve yoke stud and nut - - - - -       | 10              | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3864       | Throttle valve yoke nut (brass) - - - - -        | 1 00            | 1 00    | 1 00   | 1 00    | 1 00    | 1 00     | 1 00    | 1 00     | 1 00    |
| 3865       | Throttle valve nut - - - - -                     | 10              | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3866       | Throttle valve body - - - - -                    | 3 00            | 3 00    | 3 00   | 3 00    | 3 50    | 3 50     | 3 75    | 3 75     | 3 75    |
| 3867       | Throttle valve clapper - - - -                   | 1 75            | 1 75    | 1 75   | 1 75    | 1 75    | 1 75     | 1 75    | 1 75     | 1 75    |
| 3868       | Valve and steam chest stud - -                   | 15              | 15      | 15     | 15      | 15      | 15       | 15      | 15       | 15      |
| 3869       | Valve seat - - - - -                             | 75              | 75      | 75     | 75      | 75      | 75       | 75      | 75       | 75      |
| 3870       | Throttle valve stem - - - - -                    | 1 00            | 1 00    | 1 00   | 1 00    | 1 00    | 1 00     | 1 00    | 1 00     | 1 00    |
| 3873       | Reverse lever and head - - - -                   | 5 50            | 5 50    | 5 50   | 5 50    | 6 00    | 6 00     | 6 00    | 6 00     | 6 00    |
| 3874       | Reverse bracket - - - - -                        | 6 25            | 6 25    | 6 25   | 6 25    | 6 75    | 6 75     | 6 75    | 6 75     | 6 75    |
| 3875       | Reverse roller - - - - -                         | 2 00            | 2 00    | 2 00   | 2 00    | 2 00    | 2 00     | 2 00    | 2 00     | 2 00    |
| 3876       | Reverse roller pin - - - - -                     | 50              | 50      | 50     | 50      | 50      | 50       | 50      | 50       | 50      |
| 3877       | Reverse head stud and nut - - -                  | 15              | 15      | 15     | 15      | 15      | 15       | 15      | 15       | 15      |
| 3878       | Reverse bracket tension stud and nut - - - - -   | 20              | 20      | 20     | 20      | 20      | 20       | 20      | 20       | 20      |
| 3879       | Reverse bracket set screw - - -                  | 10              | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3880       | Reverse bracket adjust'g screw -                 | 10              | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3881       | Reverse bracket stud - - - - -                   | 20              | 20      | 20     | 20      | 20      | 20       | 20      | 20       | 20      |
| 3882       | Reverse lever yoke - - - - -                     | 50              | 50      | 50     | 50      | 50      | 50       | 50      | 50       | 50      |
| 3884       | Shaft - - - - -                                  | 30 50           | 30 50   | 33 00  | 33 00   | 36 25   | 36 25    | 44 00   | 44 00    | 44 00   |
| 3886       | Guide - - - - -                                  | 1 25            | 1 25    | 1 25   | 1 25    | 2 00    | 2 00     | 2 25    | 2 25     | 2 25    |
| 3887       | Guide block - - - - -                            | 15              | 15      | 15     | 15      | 15      | 15       | 15      | 15       | 15      |
| 3888       | Guide stud, long - - - - -                       | 20              | 20      | 20     | 20      | 20      | 20       | 20      | 20       | 20      |
| 3890       | Valve rod and slide, complete -                  | 6 00            | 6 00    | 6 00   | 6 00    | 6 00    | 6 00     | 6 00    | 6 00     | 6 00    |
| 3891       | Valve rod and nut - - - - -                      | 1 00            | 1 00    | 1 00   | 1 00    | 1 00    | 1 00     | 1 00    | 1 00     | 1 00    |
| 3893       | Throttle valve stem gland - - -                  | 25              | 25      | 25     | 25      | 25      | 25       | 25      | 25       | 25      |
| 3894       | Throttle valve stem gland stud and nut - - - - - | 10              | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3895       | Throttle valve wheel - - - - -                   | 50              | 50      | 50     | 50      | 50      | 50       | 50      | 50       | 50      |
| 3896       | Lubricator - - - - -                             | 60              | 60      | 60     | 60      | 60      | 60       | 60      | 60       | 60      |
| 3897       | Lubricator elbow - - - - -                       | 05              | 05      | 05     | 05      | 05      | 05       | 05      | 05       | 05      |
| 3898       | Lubricator nipple - - - - -                      | 10              | 10      | 10     | 10      | 10      | 10       | 10      | 10       | 10      |
| 3900       | Pulley - - - - -                                 | 17 75           | 17 75   | 17 75  | 17 75   | 23 00   | 23 00    | 23 00   | 23 00    | 23 00   |
| 3901       | Pulley key and nut - - - - -                     | 90              | 90      | 90     | 90      | 90      | 90       | 90      | 90       | 90      |
| 3903       | Malleable iron wrench - - - -                    | 25              | 25      | 25     | 25      | 25      | 25       | 25      | 25       | 25      |
| 3905       | Exhaust pipe - - - - -                           | 2 80            | 2 80    | 2 80   | 2 80    | 2 80    | 2 80     | 2 80    | 2 80     | 2 80    |

THE PAGE ADJUSTABLE  
ENGINE PUMP

## THE PAGE ADJUSTABLE ENGINE PUMP

Can be fitted to any make or size of oil country engine

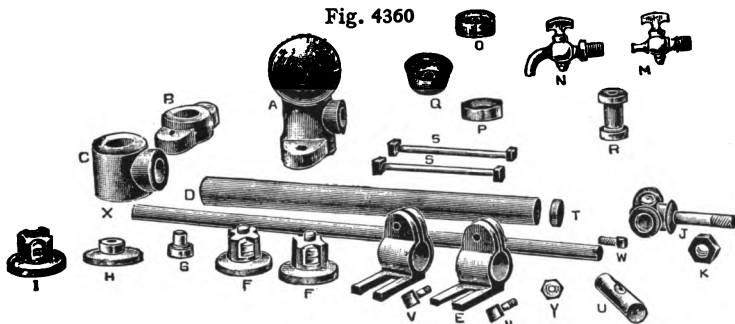
Fig. 4359



Price - - - - - \$14 00

### PARTS

Fig. 4360



|      |                                   |        |
|------|-----------------------------------|--------|
| A    | Air chamber - - - - -             | \$2 00 |
| B    | Bottom - - - - -                  | 2 00   |
| C    | Center - - - - -                  | 2 00   |
| D    | Barrel (brass) - - - - -          | 2 00   |
| E    | Clamps, per set of two - - - - -  | 2 00   |
| F    | Valves, per set of two - - - - -  | 3 50   |
| G    | Valve only - - - - -              | 50     |
| H    | Valve seat only - - - - -         | 75     |
| I    | Valve crown only - - - - -        | 75     |
| J    | Adjustable plunger head - - - - - | 75     |
| K    | Nut, crosshead end - - - - -      | 20     |
| M, N | Air cocks - - - - -               | 25     |

|   |                                     |        |
|---|-------------------------------------|--------|
| O | Screw ring for plunger - - - - -    | \$0 40 |
| P | Shoulder ring for plunger - - - - - | 30     |
| Q | Cups, per set of two - - - - -      | 20     |
| R | Sleeve for plunger - - - - -        | 40     |
| S | Pump bolts - - - - -                | 10     |
| T | Cup gauge - - - - -                 | 10     |
| U | Pin for adjustable head - - - - -   | 25     |
| V | Clamp bolts - - - - -               | 5      |
| W | Screw for head - - - - -            | 5      |
| X | Plunger rod - - - - -               | 60     |
| Y | Nut, cup end - - - - -              | 15     |

Fig. 3900

ENGINE PULLEYS

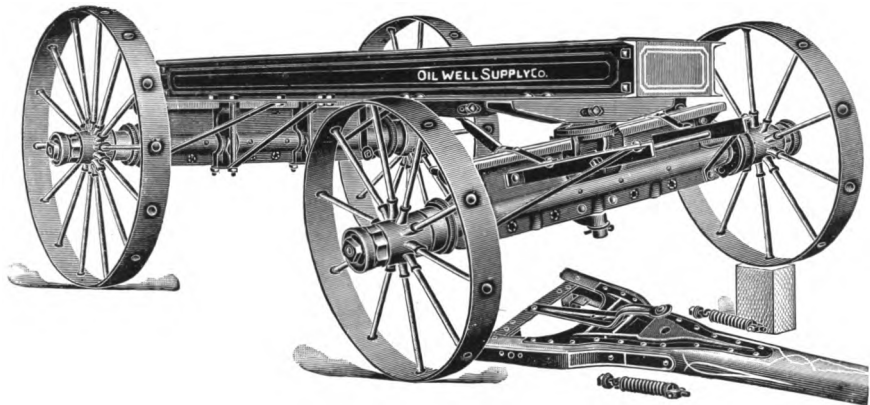


| Diam.<br>inches | Face | Weight,<br>lbs. | Price   | Diam.<br>inches | Face | Weight,<br>lbs. |       | Price   |
|-----------------|------|-----------------|---------|-----------------|------|-----------------|-------|---------|
| 16              | 10   | 180             | \$12 50 | 30              | 10   | 260             | ----- | \$18 50 |
| 18              | 12   | 190             | 13 25   | 30              | 12   | 330             | ----- | 22 50   |
| 20              | 10   | 190             | 13 25   | 30              | 14   | 380             | ----- | 25 00   |
| 20              | 12   | 215             | 14 50   | 32              | 10   | 350             | ----- | 23 50   |
| 21              | 10   | 215             | 14 50   | 32              | 12   | 345             | ----- | 24 00   |
| 21              | 12   | 232             | 15 50   | 32              | 15   | 382             | ----- | 25 00   |
| 22              | 12   | 240             | 16 50   | 36              | 12   | 495             | ----- | 33 00   |
| 24              | 12   | 250             | 17 00   | 40              | 12   | 540             | ----- | 36 50   |
| 26              | 12   | 320             | 22 00   | 48              | 12   | 695             | ----- | 46 00   |
| 27              | 12   | 260             | 17 75   | 60              | 12   | 930             | Light | 61 00   |
| 28              | 12   | 300             | 18 50   | 60              | 12   | 1,270           | Heavy | 79 50   |

TRUCK FOR STEAM OR GAS ENGINE

CONSTRUCTED ENTIRELY OF STEEL AND IRON

Fig. 1446



Special attention is directed to the **Front Axle Connection**. In traveling over rough roads the body always stands level.

Prices on application

GROOVED WHEELS

Fig. 2271



Drilled

|                              |       |        |
|------------------------------|-------|--------|
| No. 1, drilled, fig. 2271    | ----- | \$0 40 |
| No. 2, with shaft, fig. 2273 | ----- | 1 25   |

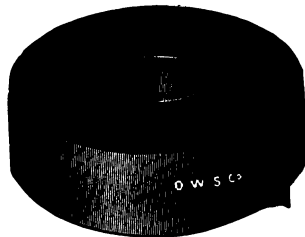
Fig. 2273



With shaft

|                                                            |       |           |        |
|------------------------------------------------------------|-------|-----------|--------|
| Reverse cord, $\frac{1}{4}$ and $\frac{3}{8}$ inch, Manila | ----- | per pound | \$0 20 |
| Telegraph cord, (6-thread seizing)                         | ----- | per pound | 25     |
| Telegraph cord, wire, 100 feet                             | ----- |           | 60     |
| Telegraph cord, wire, 150 feet                             | ----- |           | 90     |

Fig. 1532



## RUBBER BELTING

| THREE-PLY    |                 | FOUR-PLY     |                 | FIVE-PLY     |                 | SIX-PLY      |                 |
|--------------|-----------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|
| Size, inches | Price, per foot | Size, inches | Price, per foot | Size, inches | Price, per foot | Size, inches | Price, per foot |
| 2            | \$0 17          | 2            | \$0 21          | 8            | \$1 05          | 8            | \$1 26          |
| 2½           | 22              | 2½           | 26              | 9            | 1 18            | 9            | 1 42            |
| 3            | 26              | 3            | 31              | 10           | 1 33            | 10           | 1 60            |
| 3½           | 30              | 3½           | 37              | 11           | 1 47            | 11           | 1 77            |
| 4            | 34              | 4            | 42              | 12           | 1 62            | 12           | 1 95            |
| 4½           | 39              | 4½           | 47              | 13           | 1 77            | 13           | 2 13            |
| 5            | 43              | 5            | 52              | 14           | 1 92            | 14           | 2 31            |
| 6            | 52              | 6            | 62              | 15           | 2 07            | 15           | 2 49            |
| 7            | 60              | 7            | 73              | 16           | 2 22            | 16           | 2 67            |
| 8            | 70              | 8            | 84              | 18           | 2 52            | 18           | 3 03            |
| 9            | 80              | 9            | 95              | 20           | 2 82            | 20           | 3 39            |
| 10           | 90              | 10           | 1 07            | 22           | 3 15            | 22           | 3 78            |
| 11           | 1 00            | 11           | 1 18            | 24           | 3 50            | 24           | 4 20            |
| 12           | 1 08            | 12           | 1 30            | 26           | 3 85            | 26           | 4 62            |
| 13           | 1 18            | 13           | 1 42            | 28           | 4 20            | 28           | 5 04            |
| 14           | 1 28            | 14           | 1 54            | 30           | 4 55            | 30           | 5 46            |
| 15           | 1 38            | 15           | 1 66            | 32           | 4 90            | 32           | 5 88            |
| 16           | 1 50            | 16           | 1 78            | 34           | 5 25            | 34           | 6 30            |
| 18           | 1 70            | 18           | 2 02            | 36           | 5 60            | 36           | 6 72            |
| 20           | 1 90            | 20           | 2 26            | 38           | 5 95            | 38           | 7 14            |
| 22           | 2 12            | 22           | 2 52            | 40           | 6 30            | 40           | 7 56            |
| 24           | 2 36            | 24           | 2 80            | 42           | 6 65            | 42           | 7 98            |
| 26           | 2 60            | 26           | 3 08            | 44           | 7 00            | 44           | 8 40            |
| 28           | 2 84            | 28           | 3 36            | 46           | 7 35            | 46           | 8 82            |
|              |                 | 30           | 3 64            | 48           | 7 70            | 48           | 9 24            |
|              |                 | 32           | 3 92            |              |                 |              |                 |
|              |                 | 34           | 4 20            |              |                 |              |                 |
|              |                 | 36           | 4 48            |              |                 |              |                 |
|              |                 | 38           | 4 76            |              |                 |              |                 |
|              |                 | 40           | 5 04            |              |                 |              |                 |
|              |                 | 42           | 5 32            |              |                 |              |                 |
|              |                 | 44           | 5 60            |              |                 |              |                 |
|              |                 | 46           | 5 88            |              |                 |              |                 |
|              |                 | 48           | 6 16            |              |                 |              |                 |

List on 8-ply rubber belt is double that of 4-ply; on 10-ply, 2½ times that of 4-ply.

## STITCHED CANVAS BELTING

| FOUR-PLY     |                 | SIX-PLY      |                 | EIGHT-PLY    |                 |
|--------------|-----------------|--------------|-----------------|--------------|-----------------|
| Size, Inches | Price, per foot | Size, Inches | Price, per foot | Size, Inches | Price, per foot |
| 3            | \$0 30          | 6            | \$0 87          | 10           | \$1 90          |
| 4            | 40              | 7            | 1 02            | 12           | 2 28            |
| 5            | 50              | 8            | 1 16            | 14           | 2 79            |
| 6            | 60              | 9            | 1 31            | 16           | 3 19            |
| 7            | 70              | 10           | 1 45            | 18           | 3 59            |
| 8            | 80              | 12           | 1 74            | 20           | 3 99            |
| 9            | 90              | 13           | 1 99            | 22           | 4 39            |
| 10           | 1 00            | 14           | 2 13            | 24           | 4 79            |
| 12           | 1 20            | 16           | 2 44            | 26           | 5 43            |
| 14           | 1 47            | 18           | 2 74            | 28           | 5 85            |
| 16           | 1 68            | 20           | 3 05            | 30           | 6 27            |

## LEATHER BELTING

| Width, in. | 1½     | 1¾ | 2  | 2¼ | 2½ | 2¾ | 3  | 3½ | 4  | 4½   | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |
|------------|--------|----|----|----|----|----|----|----|----|------|------|------|------|------|------|------|------|------|
| Per foot   | \$0 36 | 42 | 48 | 54 | 60 | 66 | 72 | 84 | 96 | 1 08 | 1 20 | 1 44 | 1 68 | 1 92 | 2 16 | 2 40 | 2 64 | 2 88 |

Double leather belts have double the above list.



BELT CLAMPS

Fig. 1540

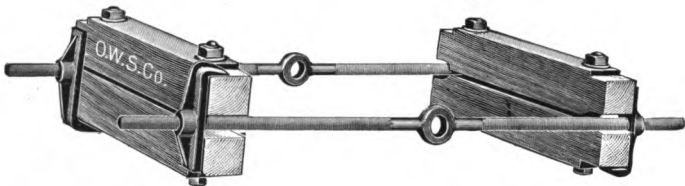


|                       |        |    |    |    |
|-----------------------|--------|----|----|----|
| Size - - - - - inches | 8      | 10 | 12 | 14 |
| Regular - - - - -     | \$0 20 | 25 | 30 | -- |
| Extra heavy - - - - - | 30     | 35 | 40 | 75 |

Extra bolts,  $\frac{3}{8}$  x  $1\frac{1}{2}$  inch - - - - \$0 02      Extra bolts,  $\frac{7}{16}$  x  $1\frac{1}{2}$  inch - - - - \$0 03

BELT TIGHTENER

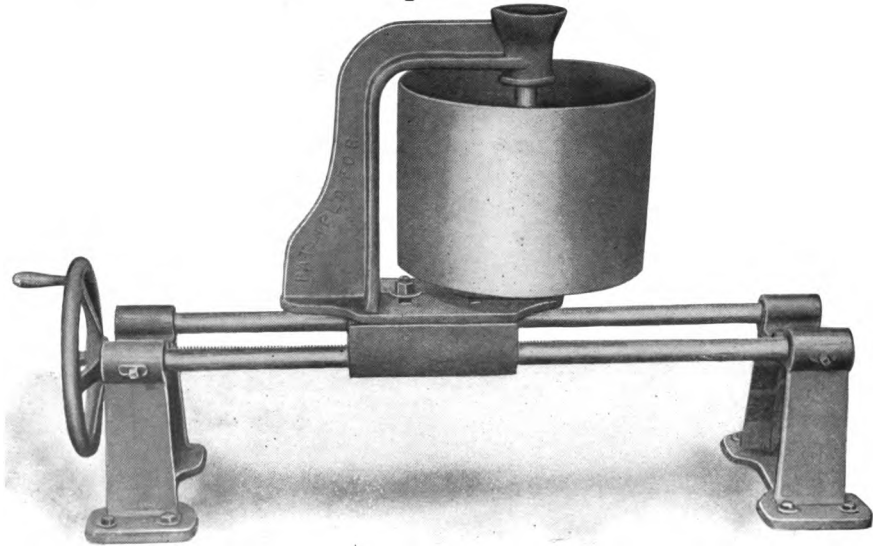
Fig. 2604



Weight, 46 pounds. Price - - - - - \$7 50

THE "GEM" SELF-OILING BELT TIGHTENER

Fig. 2606



The "Gem" Belt Tightener is constructed entirely of metal and may be set at any angle to allow the belt to run up or down as may be desired. The screw is stationary and does not extend outside the frame.

Price, each - - - - - \$29 00

**BELT HOOKS**

|                   |        |    |      |      |      |      |      |    |
|-------------------|--------|----|------|------|------|------|------|----|
| No. - - - - -     | 15     | 14 | 13   | 12   | 11   | 10   | 9    | 8  |
| Per 100 - - - - - | \$0 20 | 24 | 26   | 28   | 30   | 35   | 40   | 50 |
| No. - - - - -     | 7      | 6  | 5    | 4    | 3    | 2    | 1    |    |
| Per 100 - - - - - | \$0 60 | 85 | 1 10 | 1 40 | 1 60 | 2 00 | 3 00 |    |

Fig. 2609

**BELT PLACER**

Patent tool for putting on belts - - - - - \$5 00

**BELT PUNCH**

Fig. 2607



|                      |        |      |      |      |     |     |
|----------------------|--------|------|------|------|-----|-----|
| No. - - - - -        | 9      | 10   | 12   | 14   | 15  | 16  |
| Size (in hundredths) | .24    | .28  | .35  | .45  | .50 | .55 |
| Per dozen - - - - -  | \$2 25 | 2 50 | 2 50 | 5 00 | --- | --- |

Fig. 2611

**BELT AWL**

Price - - - - - \$0 75

**BELT LACINGS**

CUT

|                        |               |                |               |               |               |               |               |
|------------------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|
| Size - - - - - inches  | $\frac{1}{4}$ | $\frac{5}{16}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ |
| Per 100 feet - - - - - | \$1 25        | 1 50           | 1 75          | 2 25          | 3 00          | 3 75          | 4 00          |

**BELT LACINGS**

TIPPED ENDS

|                        |               |                 |               |
|------------------------|---------------|-----------------|---------------|
| Length - - - - - feet  | 6             | 6 $\frac{1}{2}$ | 7             |
| Width - - - - - inches | $\frac{1}{2}$ | $\frac{5}{8}$   | $\frac{3}{4}$ |
| Per dozen - - - - -    | \$1 70        | 2 10            | 2 75          |

**LACE LEATHER**

All sizes - - - - - Per square foot, \$0 40

**GREEN SEAL BELT DRESSING**

For cotton, leather or rubber belting - - - - - Per pound, \$0 35

In ordering, state whether for cotton, leather or rubber belting.

LUBRICATORS

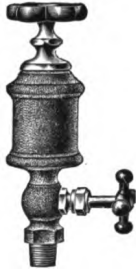
COMMON  
Fig. 4745



BRASS, STEAM METAL—Fig. 4745

| Number - - - - -          | C0              | 0               | 1               | 2               | 3             |
|---------------------------|-----------------|-----------------|-----------------|-----------------|---------------|
| Shank pipe thread, inches | $\frac{3}{8}$   | $\frac{3}{8}$   | $\frac{3}{8}$   | $\frac{3}{8}$   | $\frac{1}{2}$ |
| Diameter - - - - -        | 1               | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 2             |
| Price - - - - -           | \$2 00          | 2 20            | 2 40            | 2 60            | 2 90          |
| Number - - - - -          | 4               | 5               | 6               | 7               | 8             |
| Shank pipe thread, inches | $\frac{1}{2}$   | $\frac{1}{2}$   | $\frac{3}{4}$   | $\frac{3}{4}$   | $\frac{3}{4}$ |
| Diameter - - - - -        | 2 $\frac{1}{2}$ | 2 $\frac{1}{2}$ | 3               | 3 $\frac{1}{2}$ | 4             |
| Price - - - - -           | \$3 25          | 3 75            | 4 75            | 7 00            | 10 00         |

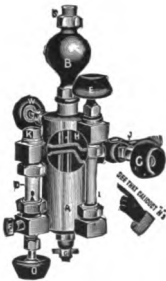
IRON BODY  
Fig. 4746



BRONZED, IRON BODY, ROUGH, WITH IRON WHEELS—  
Fig. 4746

| Diameter, inches | Capacity, pints | Threaded iron pipe | Price  |
|------------------|-----------------|--------------------|--------|
| 2                | $\frac{5}{8}$   | $\frac{1}{2}$      | \$2 25 |

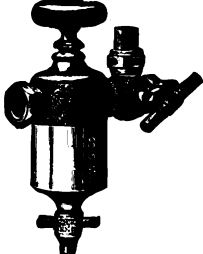
Fig. 4729



“CYCLONE” IMPROVED No. 2 SIGHT FEED  
LUBRICATOR

| Capacity - - - - -               | $\frac{1}{2}$ pint                | $\frac{1}{2}$ pint                | 1 pint                            | 1 quart                           | $\frac{1}{2}$ gal.                | 1 gal.                            |
|----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size sight feed glass - inches   | $\frac{5}{8} \times 2\frac{3}{4}$ | $\frac{3}{4} \times 2\frac{3}{4}$ | $\frac{3}{4} \times 2\frac{5}{8}$ | $\frac{3}{4} \times 2\frac{3}{4}$ | $\frac{1}{2} \times 3\frac{1}{4}$ | $\frac{3}{4} \times 3\frac{1}{4}$ |
| Size gauge glass - inches        | $\frac{5}{8} \times 2\frac{3}{4}$ | $\frac{3}{8} \times 2\frac{3}{4}$ | $\frac{3}{8} \times 3\frac{1}{4}$ | $\frac{3}{8} \times 4\frac{1}{4}$ | $\frac{1}{2} \times 7\frac{1}{4}$ | $\frac{3}{4} \times 8\frac{1}{4}$ |
| Shank threaded - inches          | $\frac{3}{8}$                     | $\frac{1}{2}$                     | $\frac{1}{2}$                     | $\frac{1}{2}$                     | $\frac{3}{4}$                     | $\frac{3}{4}$                     |
| Double con'ct'n, finished brass  | \$13 30                           | 15 00                             | 20 00                             | 26 75                             | 38 35                             | 60 00                             |
| Double con'ction, nickel plated  | 14 30                             | 16 00                             | 21 35                             | 28 35                             | 40 35                             | 63 35                             |
| Single con'ction, finished brass | 15 80                             | 17 50                             | 22 50                             | 29 25                             | 40 85                             | 62 50                             |
| Single con'ction, nickel plated  | 16 80                             | 18 50                             | 23 85                             | 30 85                             | 42 85                             | 65 85                             |
| Weight - - - - - lbs.            | 5.2                               | 6.4                               | 7.3                               | 9.2                               | 18.4                              | 19.8                              |

Fig. 4731



THE “SWIFT” DOUBLE CONNECTION  
SIGHT FEED LUBRICATOR

CLASS F.

| Capacity             | Pipe thread, inches | For engine cylinder, inches | Brass finished | Nickel plated | Weight, lbs. |
|----------------------|---------------------|-----------------------------|----------------|---------------|--------------|
| $\frac{1}{4}$ pint   | $\frac{3}{8}$       | Up to 5                     | \$2 75         | \$3 15        | 2.25         |
| $\frac{1}{2}$ pint   | $\frac{3}{8}$       | 5 to 8                      | 3 00           | 3 40          | 2.5          |
| $\frac{1}{2}$ pint   | $\frac{3}{8}$       | 8 to 12                     | 3 25           | 3 65          | 3            |
| 1 pint               | $\frac{1}{2}$       | 12 to 20                    | 4 65           | 5 30          | 4.5          |
| 1 $\frac{1}{2}$ pint | $\frac{1}{2}$       | 12 to 24                    | 5 40           | 6 05          | 5.75         |
| 1 quart              | $\frac{1}{2}$       | 20 to 30                    | 6 15           | 6 80          | 6.5          |

Fig. 4732



THE “SWIFT” SINGLE CONNECTION  
SIGHT FEED LUBRICATOR

CLASS F. S. C.

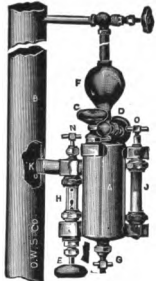
| Capacity - - - - -       | $\frac{1}{4}$ pint | $\frac{1}{2}$ pint | $\frac{1}{2}$ pint | 1 pint        | 1 $\frac{1}{2}$ pint | 1 quart       |
|--------------------------|--------------------|--------------------|--------------------|---------------|----------------------|---------------|
| Pipe thread - - - inches | $\frac{3}{8}$      | $\frac{3}{8}$      | $\frac{3}{8}$      | $\frac{1}{2}$ | $\frac{1}{2}$        | $\frac{1}{2}$ |
| Brass finish - - -       | \$3 50             | 3 75               | 4 00               | 6 00          | 6 75                 | 7 50          |
| Nickel plated - - -      | 3 90               | 4 15               | 4 40               | 6 65          | 7 40                 | 8 15          |
| Weight - - - - - lbs.    | 3.25               | 3.38               | 3.5                | 6             | 7                    | 7.5           |



DETROIT IMPROVED STANDARD SIGHT FEED  
LUBRICATORS

FOR STEAM ENGINES, PUMPS, ETC.

Fig. 4738



| Capacity             | Pipe thread, inches | Suitable for cylinder | Plain brass | Nickel plated | Weight, lbs. |
|----------------------|---------------------|-----------------------|-------------|---------------|--------------|
| $\frac{1}{2}$ pint   | $\frac{1}{2}$       | Under 10 in. diam.    | \$17 00     | 20 00         | 8            |
| $\frac{1}{2}$ pint   | $\frac{1}{2}$       | 10 to 12 inch diam.   | 22 00       | 25 00         | 10.5         |
| 1 pint               | $\frac{1}{2}$       | 12 to 18 inch diam.   | 30 00       | 35 00         | 13.5         |
| 1 quart              | $\frac{1}{2}$       | 18 to 30 inch diam.   | 45 00       | 50 00         | 16           |
| $\frac{1}{2}$ gallon | $\frac{3}{4}$       | 30 and over - - -     | 60 00       | 65 00         | 29           |
| 1 gallon             | $\frac{3}{4}$       | - - - - -             | 75 00       | 80 00         | 34           |

Fig. 4739



Pint size and larger.

$\frac{1}{2}$  and  $\frac{1}{4}$  pint sizes.



“PIONEER” SLIDE TOP GLASS OIL CUP

Fig. 4718

| Number - - - - -                          | 000             | 00              | 0               | 1               | 1 $\frac{1}{2}$ | 2               | 3               | 4               | 5               | 6               |
|-------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Extreme outside diameter of cup, inches   | 1 $\frac{3}{8}$ | 1 $\frac{7}{8}$ | 1 $\frac{5}{8}$ | 1 $\frac{3}{4}$ | 2 $\frac{1}{8}$ | 2 $\frac{3}{8}$ | 2 $\frac{1}{2}$ | 2 $\frac{1}{8}$ | 3 $\frac{3}{8}$ | 3 $\frac{1}{8}$ |
| Extreme height of cup (over all) - inches | 2 $\frac{3}{4}$ | 2 $\frac{1}{8}$ | 3 $\frac{3}{4}$ | 3 $\frac{1}{4}$ | 4 $\frac{1}{8}$ | 4 $\frac{7}{8}$ | 4 $\frac{3}{4}$ | 5               | 6               | 7 $\frac{1}{8}$ |
| Outside diameter of glass - - - inches    | 1               | 1 $\frac{1}{8}$ | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 1 $\frac{3}{4}$ | 2               | 2 $\frac{1}{4}$ | 2 $\frac{1}{2}$ | 3               | 3 $\frac{1}{2}$ |
| Height of glass - - - - - inches          | $\frac{7}{8}$   | 1               | 1 $\frac{1}{8}$ | 1 $\frac{1}{4}$ | 1 $\frac{3}{8}$ | 1 $\frac{1}{2}$ | 2 $\frac{1}{8}$ | 2 $\frac{3}{8}$ | 3               | 4               |
| Capacity - - - - - ounces                 | $\frac{1}{4}$   | $\frac{1}{2}$   | $\frac{5}{8}$   | 1               | 1 $\frac{1}{2}$ | 2 $\frac{1}{2}$ | 4               | 5               | 10              | 18              |
| Shank pipe thread - - - - - inches        | $\frac{1}{8}$   | $\frac{1}{8}$   | $\frac{1}{8}$   | $\frac{1}{4}$   | $\frac{1}{4}$   | $\frac{3}{8}$   | $\frac{3}{8}$   | $\frac{3}{8}$   | $\frac{1}{2}$   | $\frac{1}{2}$   |
| Finished brass - - - - -                  | \$0 70          | 75              | 80              | 1 00            | 1 25            | 1 50            | 1 90            | 2 40            | 3 10            | 4 00            |
| Nickel plated - - - - -                   | 80              | 85              | 95              | 1 20            | 1 50            | 1 75            | 2 20            | 2 75            | 3 50            | 4 50            |



“SENTINEL” SNAP LEVER, SIGHT FEED  
GLASS OIL CUP

Fig. 4718-A

LEVER UP

| Number - - - - -                                             | 0               | 1               | 1 $\frac{1}{2}$ | 2               | 3               | 4               | 5               | 6               |
|--------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Extreme outside diam. cup - inches                           | 1 $\frac{3}{8}$ | 2 $\frac{1}{8}$ | 2 $\frac{3}{8}$ | 2 $\frac{3}{8}$ | 2 $\frac{1}{2}$ | 2 $\frac{1}{8}$ | 3 $\frac{3}{8}$ | 3 $\frac{1}{8}$ |
| Extreme height of cup, over all, (lever up) - - - - - inches | 5 $\frac{1}{8}$ | 5 $\frac{9}{8}$ | 5 $\frac{1}{2}$ | 6 $\frac{1}{4}$ | 6 $\frac{3}{4}$ | 7 $\frac{1}{8}$ | 8 $\frac{5}{8}$ | 9 $\frac{1}{4}$ |
| Outside diameter of glass - inches                           | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 1 $\frac{3}{4}$ | 2               | 2 $\frac{1}{4}$ | 2 $\frac{1}{2}$ | 3               | 3 $\frac{1}{2}$ |
| Height of glass - - - - - inches                             | 1 $\frac{1}{8}$ | 1 $\frac{1}{8}$ | 1 $\frac{1}{8}$ | 1 $\frac{3}{8}$ | 2 $\frac{1}{8}$ | 2 $\frac{3}{8}$ | 3               | 4               |
| Shank pipe thread - - - - - inches                           | $\frac{1}{8}$   | $\frac{1}{4}$   | $\frac{1}{4}$   | $\frac{3}{8}$   | $\frac{3}{8}$   | $\frac{3}{8}$   | $\frac{1}{2}$   | $\frac{1}{2}$   |
| Capacity - - - - - ounces                                    | $\frac{5}{8}$   | 1               | 1 $\frac{1}{2}$ | 2 $\frac{1}{2}$ | 4               | 5               | 10              | 18              |
| Finished brass - - - - -                                     | \$3 00          | 3 25            | 3 50            | 3 75            | 4 25            | 5 25            | 7 25            | 9 25            |
| Nickel plated - - - - -                                      | 3 50            | 3 75            | 4 00            | 4 25            | 4 75            | 5 75            | 8 00            | 10 25           |

Fig. 4719



## OIL CUPS, ETC.

LUNKENHEIMER'S "ROYAL" SIGHT FEED

## GLASS OIL CUP

| Number - - - - -                   | 000    | 00   | 0    | 1    | 1½   | 2    | 3    | 4    | 5    | 6    |
|------------------------------------|--------|------|------|------|------|------|------|------|------|------|
| Outside diameter of glass - inches | 1      | 1½   | 1½   | 1½   | 1½   | 2    | 2½   | 2½   | 3    | 3½   |
| Height of glass - inches           | ¾      | 1    | 1½   | 1½   | 1½   | 1½   | 2½   | 2½   | 3    | 4    |
| Shank, pipe thread - inches        | ¾      | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    |
| Capacity - ounces                  | ¼      | ½    | ¾    | 1    | 1½   | 2½   | 4    | 5    | 10   | 18   |
| Finished brass - - - - -           | \$0 95 | 1 10 | 1 25 | 1 50 | 1 75 | 2 10 | 2 55 | 3 15 | 3 90 | 4 80 |
| Nickel plated - - - - -            | 1 05   | 1 20 | 1 40 | 1 70 | 2 00 | 2 35 | 2 85 | 3 50 | 4 30 | 5 30 |

Fig. 4725



## "CHAMPION" ROD OIL CUP

SUITABLE FOR ALL MOVABLE BEARINGS

| No. | Capacity, ounces | Outside diameter, inches | Height of cup closed, inches | Height of cup open, inches | Width, inches | Shank, pipe thread, inches | Price, finished brass | Price, nickel plated | Glasses, each |
|-----|------------------|--------------------------|------------------------------|----------------------------|---------------|----------------------------|-----------------------|----------------------|---------------|
| 1   | 1½               | 2                        | 3½                           | 4½                         | 1½            | ¾                          | \$1 40                | 1 50                 | 05            |
| 2   | 2½               | 2½                       | 3¾                           | 4¾                         | 2             | ¾                          | 2 00                  | 2 20                 | 08            |
| 3   | 5                | 3                        | 4¾                           | 5¾                         | 2½            | ¾                          | 2 60                  | 2 80                 | 10            |
| 4   | 12               | 4                        | 5¾                           | 7½                         | 4             | ¾                          | 4 00                  | 4 40                 | 15            |

Fig. 4722



## CROWN INDEX SIGHT FEED OIL CUP

| Number - - - - -                | 0      | 1    | 1½   | 2    | 3    | 4    | 5    | 6    |
|---------------------------------|--------|------|------|------|------|------|------|------|
| Outside diam. of glass - inches | 1½     | 1½   | 1½   | 2    | 2½   | 2½   | 3    | 3½   |
| Capacity - ounces               | ¾      | 1    | 1½   | 2½   | 4    | 5    | 10   | 18   |
| Pipe thread - inches            | ¾      | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    |
| Finished brass - each           | \$1 25 | 1 50 | 1 75 | 2 10 | 2 55 | 3 15 | 3 90 | 4 80 |
| Nickel plated - each            | 1 40   | 1 70 | 2 00 | 2 35 | 2 85 | 3 50 | 4 30 | 5 30 |

Fig. 4724



## PARAGON SIGHT FEED OIL CUP

FOR GASOLINE AND OIL ENGINES

| Number - - - - -                | 1½     | 2    | 3    | 4    | 5    | 6    | 8     |
|---------------------------------|--------|------|------|------|------|------|-------|
| Outside diam. of glass - inches | 1½     | 2    | 2½   | 2½   | 3    | 3½   | 4½    |
| Capacity - ounces               | 1½     | 2½   | 4    | 5    | 10   | 18   | 32    |
| Pipe thread - inches            | ¾      | ¾    | ¾    | ¾    | ¾    | ¾    | ¾     |
| Finished brass - each           | \$2 00 | 2 80 | 3 50 | 4 00 | 5 40 | 7 00 | 14 00 |
| Nickel plated - each            | 2 40   | 3 25 | 4 10 | 4 60 | 6 25 | 8 20 | 16 40 |

Fig. 4717



**CYLINDRICAL GLASS  
FOR OIL CUPS**

| Number - - - - -            | 000    | 00 | 0  | 1  | 1½ | 2  | 3  | 4  | 5  | 6  | 8    |
|-----------------------------|--------|----|----|----|----|----|----|----|----|----|------|
| Outside diameter - - inches | 1      | 1½ | 1½ | 1½ | 1¾ | 2  | 2¼ | 2½ | 3  | 3½ | 4¼   |
| Height - - - - - inches     | 7/8    | 1  | 1½ | 1½ | 1¾ | 1¾ | 2½ | 2¾ | 3  | 4  | 5    |
| Price - - - - - each        | \$0 05 | 05 | 08 | 10 | 10 | 12 | 15 | 25 | 35 | 65 | 1 50 |
| Cork washers - - per dozen  | 15     | 18 | 24 | 30 | 36 | 40 | 45 | 50 | 60 | 75 | 1 50 |

**LUNKENHEIMER'S "IDEAL" AUTOMATIC GREASE CUP**

Fig. 4723



| Number - - - - -                      | 00     | 0    | 1    | 2    | 3    | 4    |
|---------------------------------------|--------|------|------|------|------|------|
| Extreme outside diameter - - - inches | 1¾     | 1¾   | 2    | 2¾   | 3½   | 3¾   |
| Extreme height - - - - - inches       | 3¼     | 4¾   | 5¼   | 6½   | 7½   | 8¾   |
| Shank. pipe thread - - - - - inches   | ½      | ¾    | ¾    | ¾    | ¾    | ¾    |
| Capacity (grease) - - - - - ounces    | ½      | 1    | 1½   | 3    | 6    | 10   |
| Finished brass - - - - - each         | \$1 50 | 2 00 | 2 50 | 3 20 | 4 30 | 6 00 |
| Nickel plated - - - - - each          | 1 75   | 2 25 | 2 80 | 3 60 | 5 00 | 6 75 |

**JEWEL AUTOMATIC GREASE CUP**

Fig. 4726



| Number - - - - -                 | 00     | 0    | 1    | 2    | 3    | 4    |
|----------------------------------|--------|------|------|------|------|------|
| Inside diameter - - - - - inches | 1      | 1½   | 1½   | 2    | 2½   | 3    |
| Pipe thread - - - - - inches     | ¾      | ¾    | ¾    | ¾    | ¾    | ¾    |
| Capacity - - - - - ounces        | ¾      | 1    | 1½   | 3    | 6    | 10   |
| Finished Brass - - - - - each    | \$0 80 | 1 00 | 1 30 | 1 70 | 2 30 | 3 20 |
| Nickel Plated - - - - - each     | 1 00   | 1 30 | 1 70 | 2 20 | 2 90 | 3 90 |

Fig. 4727

**REX GREASE CUP, SPUN TOP**



| Number - - - - -                 | 6      | 7  | 8  | 9    |
|----------------------------------|--------|----|----|------|
| Inside diameter - - - - - inches | 1½     | 1¾ | 2½ | 2¾   |
| Pipe thread - - - - - inches     | ¾      | ¾  | ¾  | ¾    |
| Capacity - - - - - ounces        | ¾      | 1½ | 3½ | 5    |
| Each - - - - -                   | \$0 55 | 70 | 90 | 1 20 |

**ARCTIC CUP GREASE**

|                             |            |        |
|-----------------------------|------------|--------|
| In 10 pound pails - - - - - | per pound. | \$0 12 |
| In 5 pound pails - - - - -  | per pound. | 15     |

## BRASS AIR COCKS

## STEAM METAL

**Fig. 4690**



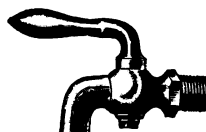
**Fig. 4694**



**Fig. 4696**



**Fig. 4698**

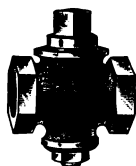


| Sizes - - - - -                                     | inches         | ¾      | ¾    | ¾    | ¾    |
|-----------------------------------------------------|----------------|--------|------|------|------|
| T-handle, single thread, fig. 4690                  | - - - - -      | \$0 40 | 45   | 50   | 60   |
| T-handle, double thread                             | - - - - -      | 55     | 65   | 75   | 90   |
| T-handle, bibb nozzle, single thread, fig. 4694-    | - - - - -      | 70     | 80   | 90   | 1 00 |
| T-handle, bibb nozzle, double thread                | - - - - -      | 80     | 1 00 | 1 10 | 1 35 |
| Weight per 100                                      | - - - - - lbs. | 13     | 18   | 25   | 32   |
| Lever handle, single thread, fig. 4696              | - - - - -      | 55     | 60   | 65   | 75   |
| Lever handle, double thread                         | - - - - -      | 70     | 80   | 90   | 1 05 |
| Lever handle, bibb nozzle, single thread, fig. 4698 | - - - - -      | 85     | 95   | 1 05 | 1 15 |
| Lever handle, bibb nozzle, double thread            | - - - - -      | 95     | 1 15 | 1 25 | 1 50 |
| Weight per 100-                                     | - - - - - lbs. | 16     | 21   | 28   | 35   |
| T-handle, female                                    | - - - - -      | 65     | 70   | 85   | - -  |
| T-handle, male and female                           | - - - - -      | 75     | 80   | 90   | - -  |
| Lever handle, female                                | - - - - -      | 80     | 85   | 1 00 | - -  |
| Lever handle, male and female                       | - - - - -      | 90     | 95   | 1 05 | - -  |

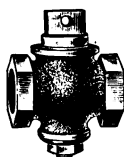
## BRASS STEAM COCKS

## STEAM METAL STANDARD

**Fig. 4659**



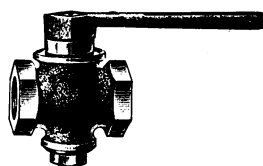
**Fig. 4658**



**Fig. 4656**



**Fig. 4655**



| Square head                       |           | Flat head |     |      |      | T-handle |      |      |      | Lever handle |       |       |       |       |   |
|-----------------------------------|-----------|-----------|-----|------|------|----------|------|------|------|--------------|-------|-------|-------|-------|---|
| Sizes                             | - - -     | Inches    | ⅛   | ¼    | ⅜    | ½        | ¾    | 1    | 1¼   | 1½           | 2     | 2½    | 3     | 3½    | 4 |
| Square or flat head or T-handle - | fig. 4659 |           |     |      |      |          |      |      |      |              |       |       |       |       |   |
|                                   | fig. 4658 | \$0 85    | 85  | 1 00 | 1 25 | 1 70     | 2 35 | 3 70 | 4 85 | 7 30         | 14 50 | 22 50 | 38 50 | 50 00 |   |
|                                   | fig. 4656 |           |     |      |      |          |      |      |      |              |       |       |       |       |   |
| Weight -                          | lbs.      | -         | .25 | .44  | .63  | 1.4      | 2    | 2.4  | 4.4  | 6.5          | 10    | 17    | ---   | ---   |   |
| Lever handle, fig. 4655           |           | 95        | 95  | 1 10 | 1 35 | 1 85     | 2 60 | 4 10 | 5 25 | 7 80         | ---   | ---   | ---   | ---   |   |
| Weight -                          | lbs.      | -         | .5  | .8   | 1.2  | 1.5      | 2.8  | 3.8  | 7    | 10           | ---   | ---   | ---   | ---   |   |

**EXTRA HEAVY OR No. 1**

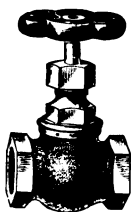
[illegible]



## BRASS GLOBE AND ANGLE VALVES

## STANDARD—SCREWED

Fig. 4617



Globe

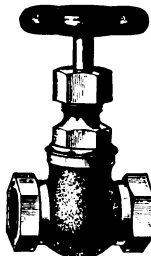
Fig. 4618



Angle

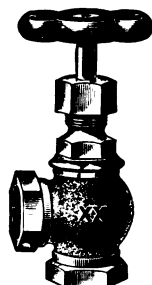
## EXTRA HEAVY OR No. 1—SCREWED

Fig. 4620



Globe

Fig. 4620-A



Angle

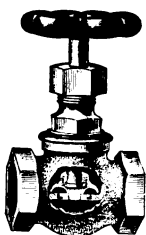
| Sizes - - - - - inches                     | $\frac{1}{8}$ | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | $1\frac{1}{2}$ |
|--------------------------------------------|---------------|---------------|---------------|---------------|---------------|------|----------------|
| Standard, figs. 4617, 4618 - - - - -       | \$0 72        | 72            | 77            | 1 00          | 1 26          | 1 80 | 2 52           |
| Weight - - - - - lbs.                      | .45           | .45           | .6            | .9            | 1.5           | 2.3  | 3.2            |
| Extra heavy or No. 1, figs. 4620, 4620-A - | \$1 25        | 1 25          | 1 45          | 1 85          | 2 50          | 3 50 | 5 25           |
| Weight - - - - - lbs.                      | .5            | .5            | .7            | 1 1           | 1.7           | 2.7  | 4              |

| Sizes - - - - - inches                     | $1\frac{1}{2}$ | 2     | $2\frac{1}{2}$ | 3     | $3\frac{1}{2}$ | 4     |
|--------------------------------------------|----------------|-------|----------------|-------|----------------|-------|
| Standard, figs. 4617, 4618 - - - - -       | \$3 50         | 5 30  | 10 00          | 14 40 | 26 50          | 36 00 |
| Weight - - - - - lbs.                      | 4.4            | 7     | 11             | 17    | -----          | ----- |
| Extra heavy or No. 1, figs. 4620, 4620-A - | \$7 00         | 10 50 | 20 00          | 27 00 | 50 00          | 65 00 |
| Weight - - - - - lbs.                      | 5.7            | 9.7   | 14.5           | 21    | -----          | ----- |

## FRINK'S PATENT VALVES

Fig. 4625



Globe

Fig. 4625-A



Angle

## JENKINS' PATENT VALVES

Fig. 4626



Globe

| Sizes - - - - - inches            | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | $1\frac{1}{2}$ | $1\frac{1}{2}$ | 2    | $2\frac{1}{2}$ | 3     |
|-----------------------------------|---------------|---------------|---------------|---------------|------|----------------|----------------|------|----------------|-------|
| Frink, globe or angle - - - - -   | \$0 80        | 1 00          | 1 25          | 1 75          | 2 50 | 3 35           | 4 60           | 7 00 | 14 00          | 20 00 |
| Weight - - - - - lbs.             | .6            | .65           | .7            | 1.5           | 2.4  | 3.2            | 4.7            | 7.7  | -----          | ----- |
| Jenkins, globe or angle - - - - - | \$1 10        | 1 25          | 1 60          | 2 20          | 2 80 | 4 00           | 5 50           | 8 75 | 15 75          | 22 00 |
| Weight - - - - - lbs.             | .8            | .8            | 1.4           | 1.6           | 2.5  | 3.3            | 5              | 8.3  | 22             | 27    |

## DISKS

For all patterns of Frink's and Jenkins' disk valves

| Sizes - - - - - inches | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1  | $1\frac{1}{2}$ | $1\frac{1}{2}$ | 2  | $2\frac{1}{2}$ | 3  | $3\frac{1}{2}$ | 4  |
|------------------------|---------------|---------------|---------------|---------------|----|----------------|----------------|----|----------------|----|----------------|----|
| Price - - - - -        | \$0 03        | 04            | 04            | 05            | 06 | 09             | 12             | 18 | 24             | 33 | 45             | 52 |

| Sizes - - - - - inches | $4\frac{1}{2}$ | 5  | 6  | 7  | 8    | 10   | 12   | 14   | 16   | 18   | 20   | 24   |
|------------------------|----------------|----|----|----|------|------|------|------|------|------|------|------|
| Price - - - - -        | \$0 60         | 68 | 90 | 98 | 1 20 | 1 75 | 2 25 | 3 00 | 4 00 | 5 00 | 6 00 | 9 00 |

## STANDARD BRASS CHECK VALVES

## STEAM METAL

## HORIZONTAL

Fig. 4635



Screwed

## ANGLE

Fig. 4638



Screwed

| Sizes                          | - | - | - | - | - | - | - | inches | $\frac{1}{8}$ | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | $1\frac{1}{4}$ |
|--------------------------------|---|---|---|---|---|---|---|--------|---------------|---------------|---------------|---------------|---------------|------|----------------|
| Horizontal, screwed, fig. 4635 | - | - | - | - | - | - | - | -      | \$0 65        | 65            | 70            | 90            | 1 15          | 1 60 | 2 25           |
| Weight                         | - | - | - | - | - | - | - | -      | -             | -             | .25           | .5            | .9            | 1.6  | 2.1            |
| Angle, screwed, fig. 4638      | - | - | - | - | - | - | - | -      | \$0 72        | 72            | 77            | 1 00          | 1 26          | 1 80 | 2 52           |
| Weight                         | - | - | - | - | - | - | - | -      | -             | -             | -             | -             | -             | -    | -              |

| Sizes                          | - | - | - | - | - | - | - | inches | $1\frac{1}{2}$ | 2    | $2\frac{1}{2}$ | 3     | $3\frac{1}{2}$ | 4     | - |
|--------------------------------|---|---|---|---|---|---|---|--------|----------------|------|----------------|-------|----------------|-------|---|
| Horizontal, screwed, fig. 4635 | - | - | - | - | - | - | - | -      | \$3 15         | 4 75 | 9 00           | 13 00 | 24 00          | 32 50 | - |
| Weight                         | - | - | - | - | - | - | - | -      | 3              | 5.4  | 8.9            | 14.6  | -              | -     | - |
| Angle, screwed, fig. 4638      | - | - | - | - | - | - | - | -      | \$3 50         | 5 30 | 10 00          | 14 40 | 26 50          | 36 00 | - |
| Weight                         | - | - | - | - | - | - | - | -      | -              | -    | -              | -     | -              | -     | - |

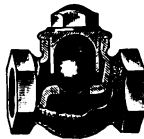
## HORIZONTAL

Fig. 4636



With Drip Cock

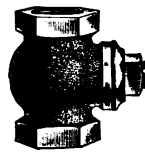
Fig. 4637



With Ball

## VERTICAL—Cap at side

Fig. 4640



Screwed

| Sizes                        | - | - | - | - | - | - | - | inches | $\frac{1}{8}$ | $\frac{1}{4}$ | 1    | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2    | $2\frac{1}{2}$ | 3     |
|------------------------------|---|---|---|---|---|---|---|--------|---------------|---------------|------|----------------|----------------|------|----------------|-------|
| With drip cock, fig. 4636    | - | - | - | - | - | - | - | -      | \$2 15        | 2 55          | 3 15 | 4 05           | 5 40           | -    | -              | -     |
| With ball, fig. 4637         | - | - | - | - | - | - | - | -      | 1 60          | 2 30          | 3 10 | 4 00           | 6 20           | 9 40 | -              | -     |
| Vertical, screwed, fig. 4640 | - | - | - | - | - | - | - | -      | 1 85          | 2 50          | 3 25 | 4 15           | 5 00           | 7 25 | 18 00          | 25 00 |
| Weight                       | - | - | - | - | - | - | - | -      | .0            | 1             | 1.5  | 2.2            | 3.5            | 6    | -              | -     |

## VERTICAL

Fig. 4639



Screwed

Fig. 4643

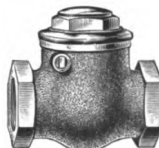


Ball

## STRAIGHTWAY SWINGING CHECKS

## NEARY

Fig. 4642



## PRATT &amp; CADY

Fig. 4646



| Sizes                           | - | - | - | - | - | - | - | inches | $\frac{1}{8}$ | $\frac{1}{4}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2    | $2\frac{1}{2}$ | 3     | $3\frac{1}{2}$ | 4     |
|---------------------------------|---|---|---|---|---|---|---|--------|---------------|---------------|---------------|---------------|------|----------------|----------------|------|----------------|-------|----------------|-------|
| Vertical, screwed, fig. 4639    | - | - | - | - | - | - | - | -      | \$0 72        | 77            | 1 00          | 1 26          | 1 80 | 2 52           | 3 50           | 5 30 | 10 00          | 14 40 | 26 50          | 36 00 |
| Vertical ball, fig. 4643        | - | - | - | - | - | - | - | -      | -             | -             | 1 60          | 2 30          | 3 10 | 4 00           | 6 20           | 9 40 | -              | -     | -              | -     |
| Weight                          | - | - | - | - | - | - | - | -      | .25           | .4            | .5            | .8            | 1.5  | 1.7            | 2.4            | 3.7  | 8.9            | 14.5  | -              | -     |
| Neary swinging check, fig. 4642 | - | - | - | - | - | - | - | -      | \$1 25        | 1 30          | 1 50          | 1 75          | 2 25 | 3 25           | 4 25           | 6 25 | 12 00          | 20 00 | -              | -     |
| Pratt & Cady, fig. 4646         | - | - | - | - | - | - | - | -      | 1 25          | 1 30          | 1 50          | 1 75          | 2 25 | 3 25           | 4 25           | 6 25 | 12 00          | 20 00 | -              | -     |
| Weight                          | - | - | - | - | - | - | - | -      | -             | -             | .8            | 1.4           | 1.8  | 3              | 4.3            | 6.2  | 11.8           | -     | -              | -     |

## EXTRA HEAVY OR No. 1 BRASS CHECK VALVES

HORIZONTAL  
Fig. 4645

Screwed

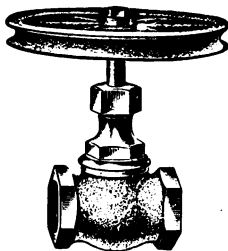
STEAM METAL

ANGLE  
Fig. 4645-B

Screwed

| Sizes - inches                | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2    | 2 $\frac{1}{2}$ | 3     | 3 $\frac{1}{2}$ | 4     |
|-------------------------------|---------------|---------------|---------------|---------------|------|-----------------|-----------------|------|-----------------|-------|-----------------|-------|
| Horizontal and angle, screwed | \$1 10        | 1 30          | 1 65          | 2 20          | 3 00 | 4 75            | 6 25            | 9 50 | 18 50           | 25 00 | 47 00           | 60 00 |
| Weight - lbs.                 | -----         | .5            | .6            | 1             | 1.7  | 2.5             | 3.8             | 6.5  | 13              | 21    | -----           | ----- |

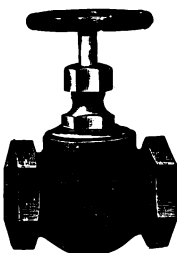
Fig. 4619



## GLOBE VALVE

WITH LARGE GROVED WHEEL

| Sizes - - - - inches  | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2    |
|-----------------------|-----------------|-----------------|------|
| Brass - - - - - each  | \$4 00          | 5 00            | 7 00 |
| Iron Body - - - - - " | 4 50            | 5 50            | 7 50 |

GLOBE  
Fig. 4900

Screwed

STANDARD IRON BODY VALVES  
BRASS MOUNTED

| Sizes - - - - inches                                 | $\frac{3}{4}$ | 1      | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ |
|------------------------------------------------------|---------------|--------|-----------------|-----------------|
| Iron body, screwed, globe or angle - - - - -         | -----         | \$2 25 | 2 75            | 3 50            |
| All iron, screwed, not illustrated, globe or angle - | -----         | 5 70   | 6 00            | 6 60            |
| Weight - - - - - lbs.                                | -----         | 3.4    | 3.9             | 4.3             |

| Sizes - - - - inches                                 | 2    | 2 $\frac{1}{2}$ | 3     |
|------------------------------------------------------|------|-----------------|-------|
| Iron body, screwed, globe or angle - - - - -         | 5 40 | 7 35            | 9 80  |
| All iron, screwed, not illustrated, globe or angle - | 7 50 | 9 40            | 12 50 |
| Weight - - - - - lbs.                                | 10.8 | 15.8            | 23.5  |

ANGLE  
Fig. 4903

Screwed

HORIZONTAL  
Fig. 4923

Screwed

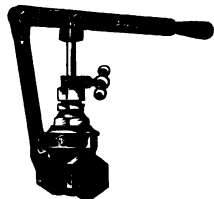
## STANDARD IRON BODY CHECK VALVES

HORIZONTAL AND ANGLE, WITH BRASS CAP

| Sizes - inches                | 1      | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2    | 2 $\frac{1}{2}$ | 3    |
|-------------------------------|--------|-----------------|-----------------|------|-----------------|------|
| Horizontal and angle, screwed | \$1 50 | 2 20            | 2 65            | 3 60 | 6 50            | 8 90 |
| Weight - lbs.                 | -----  | -----           | -----           | 8    | 13              | 18.6 |

ANGLE  
Fig. 4931

Screwed

**BRASS GATE VALVES—BURNHAM'S****QUICK OPENING WITH SLIDING STEM AND LEVER****Fig. 4852**

| Sizes - - - inches  | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2     | $2\frac{1}{2}$ | 3     |
|---------------------|---------------|---------------|------|----------------|----------------|-------|----------------|-------|
| Each - - - - -      | \$2.50        | 3.00          | 4.00 | 5.00           | 7.00           | 10.00 | 19.00          | 25.00 |
| Weight - - - - lbs. | --            | 4.4           | 5.5  | ---            | ---            | 10.6  | 16             | ---   |

## IRON COCKS

## SQUARE AND FLAT HEAD

Fig. 4983



Square head

Fig. 4984



Flat head

## No. 1—HEAVY PATTERN

| Sizes - inches                      | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2    | $2\frac{1}{2}$ | 3     | $3\frac{1}{2}$ | 4     | 5      | 6      |
|-------------------------------------|---------------|---------------|------|----------------|----------------|------|----------------|-------|----------------|-------|--------|--------|
| Weight - lbs.                       | 1.5           | 2.1           | 4.2  | 5              | 9              | 14   | 20             | 29    | -----          | 70    | -----  | -----  |
| All iron, square or flat head - - - | \$1 15        | 1 25          | 1 75 | 2 10           | 2 80           | 3 65 | 6 50           | 9 00  | 16 75          | 22 50 | 45 00  | 62 00  |
| With brass washer - -               | 1 25          | 1 40          | 2 00 | 2 45           | 3 20           | 4 15 | 7 25           | 10 00 | 18 75          | 26 00 | 51 00  | 70 00  |
| With brass plug -                   | 1 70          | 2 25          | 2 80 | 3 85           | 5 60           | 7 00 | 13 25          | 19 00 | 42 00          | 56 00 | 98 00  | 133 00 |
| With brass plug and washer - -      | 1 80          | 2 40          | 3 05 | 4 20           | 6 00           | 7 50 | 14 00          | 20 00 | 44 00          | 59 50 | 104 00 | 141 00 |

Fig. 4985



Square head

Fig. 4986



Flat head

## No. 2—REGULAR PATTERN

| Sizes - inches                  | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2    | $2\frac{1}{2}$ | 3     | $3\frac{1}{2}$ | 4     | 5     | 6      |
|---------------------------------|---------------|---------------|---------------|------|----------------|----------------|------|----------------|-------|----------------|-------|-------|--------|
| Weight - lbs.                   | -----         | 1.1           | 1.6           | 2.4  | 4.3            | 6              | 10   | 17             | 27    | -----          | ----- | ----- | -----  |
| All iron, square or flat head - | \$0 85        | 90            | 1 05          | 1 30 | 1 60           | 1 95           | 2 70 | 4 40           | 6 75  | 12 00          | 15 50 | 32 00 | 45 00  |
| With brass washer - -           | -----         | 1 00          | 1 20          | 1 55 | 1 95           | 2 35           | 3 20 | 5 15           | 7 75  | 14 00          | 19 00 | 38 00 | 53 00  |
| With brass plug -               | 1 25          | 1 30          | 1 60          | 1 90 | 2 65           | 3 75           | 5 25 | 8 75           | 13 00 | 27 50          | 36 50 | 67 00 | 94 00  |
| With brass plug and washer -    | -----         | 1 40          | 1 75          | 2 15 | 3 00           | 4 15           | 5 75 | 9 50           | 14 00 | 29 50          | 40 00 | 73 00 | 102 00 |

Fig. 4987



## ROUND WAY

| Sizes - - - - - inches                     | 2      | 3     |
|--------------------------------------------|--------|-------|
| Weight - - - - - lbs.                      | 25     | ----- |
| With iron nut and washer - - - - -         | \$8 50 | ----- |
| With iron nut and brass washer - - - - -   | 9 00   | 18 25 |
| With brass plug, nut, and washer - - - - - | 13 50  | 27 00 |



## REVISED CLASSIFICATION AND PRICE LIST.

Adopted June 5, 1907.

**MALLEABLE IRON FITTINGS**

FOR STEAM, GAS AND WATER.

| CLASS                        | A                                                                                                                                            | B                                                                                                                                                                                                                                                                                                  | C                           |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Price, per pound, black - -  | .40                                                                                                                                          | .20                                                                                                                                                                                                                                                                                                | .12                         |
| Price, per pound,galvanized- | .50                                                                                                                                          | .28                                                                                                                                                                                                                                                                                                | .19                         |
| Elbows - - - - -             | $\frac{1}{8} \times \frac{1}{8}$ $\frac{1}{4} \times \frac{1}{4}$<br>$\frac{3}{8} \times \frac{3}{8}$                                        | $\frac{1}{4} \times \frac{1}{4}$ $\frac{3}{8} \times \frac{3}{8}$ $\frac{1}{2} \times \frac{1}{2}$<br>$\frac{3}{8} \times \frac{3}{8}$ $\frac{1}{4} \times \frac{1}{4}$ $\frac{1}{2} \times \frac{3}{8}$                                                                                           | * $\frac{3}{4}$ and larger  |
| Elbows, right and left - - - | $\frac{1}{4}$ and $\frac{3}{8}$                                                                                                              | $\frac{1}{2}$ , $\frac{3}{4}$ and 1                                                                                                                                                                                                                                                                | * $1\frac{1}{4}$ and larger |
| Elbows, 45° - - - - -        |                                                                                                                                              | $\frac{1}{4}$ to 2 inclusive                                                                                                                                                                                                                                                                       | $2\frac{1}{2}$ and larger   |
| Elbows, Street - - - - -     |                                                                                                                                              | $\frac{1}{4}$ and $\frac{3}{8}$                                                                                                                                                                                                                                                                    | 1 and larger                |
| Elbows, Side Outlet - - -    |                                                                                                                                              | $\frac{1}{4}$ and $\frac{3}{4}$ $\frac{3}{8} \times \frac{1}{2}$ and $1 \times \frac{1}{4}$                                                                                                                                                                                                        |                             |
| Elbows, drop - - - - -       |                                                                                                                                              | All Sizes                                                                                                                                                                                                                                                                                          |                             |
|                              |                                                                                                                                              | All Sizes, Reducing and Straight                                                                                                                                                                                                                                                                   |                             |
| Tees - - - - -               | $\frac{1}{8} \times \frac{1}{8}$<br>$\frac{1}{4} \times \frac{1}{4}$<br>$\frac{3}{8} \times \frac{3}{8}$<br>$\frac{1}{2} \times \frac{1}{2}$ | $\frac{1}{4} \times \frac{1}{4}$ $\frac{3}{8} \times \frac{3}{8}$<br>$\frac{1}{4} \times \frac{3}{8}$<br>$\frac{3}{8} \times \frac{1}{4} \times \frac{1}{4}$ $\frac{1}{2}$ , and $\frac{1}{4}$<br>$\frac{3}{8} \times \frac{1}{4}$ Reducing<br>$\frac{3}{8} \times \frac{1}{4} \times \frac{1}{8}$ | * $\frac{3}{4}$ and larger  |
| Tees, street - - - - -       |                                                                                                                                              | $\frac{3}{4}$ and $1 \times \frac{1}{2} \times 1$                                                                                                                                                                                                                                                  | 1 and larger                |
| Tees, Four-way - - - - -     |                                                                                                                                              | All sizes                                                                                                                                                                                                                                                                                          |                             |
| Tees, drop - - - - -         |                                                                                                                                              | All Sizes, Straight and Reducing                                                                                                                                                                                                                                                                   |                             |
| Straight Crosses - - - - -   |                                                                                                                                              | $\frac{1}{4}$ to 1 inclusive                                                                                                                                                                                                                                                                       | $1\frac{1}{4}$ and larger   |
| Reducing Crosses - - - - -   |                                                                                                                                              | 1 and Smaller                                                                                                                                                                                                                                                                                      | * $1\frac{1}{4}$ and larger |
| Y Bends - - - - -            |                                                                                                                                              | All Sizes                                                                                                                                                                                                                                                                                          |                             |
| Return Bends - - - - -       | $\frac{1}{4}$                                                                                                                                | $\frac{3}{8}$ to 1 inclusive                                                                                                                                                                                                                                                                       | $1\frac{1}{4}$ and larger   |
| Return Bends, Right and Left | $\frac{3}{8}$ and $\frac{1}{2}$                                                                                                              | $\frac{3}{4}$ and larger                                                                                                                                                                                                                                                                           |                             |
| Couplings, R. H. - - - - -   | $\frac{1}{8}$                                                                                                                                | $\frac{1}{4}$ to $\frac{3}{4}$ inclusive                                                                                                                                                                                                                                                           | 1 and larger                |
| Couplings, R. and L. - - -   | $\frac{1}{8}$                                                                                                                                | $\frac{1}{4}$ to $\frac{3}{4}$ inclusive                                                                                                                                                                                                                                                           | 1 and larger                |
| Couplings, Reducing - - -    | $\frac{1}{4} \times \frac{1}{8}$ $\frac{3}{8} \times \frac{1}{8}$<br>$\frac{1}{2} \times \frac{1}{8}$                                        | $\frac{3}{8} \times \frac{1}{4}$ to $1 \times \frac{1}{4}$<br>inclusive                                                                                                                                                                                                                            | $1\frac{1}{4}$ and larger   |
| Caps - - - - -               | $\frac{1}{8}$                                                                                                                                | $\frac{1}{4}$ to 1 inclusive                                                                                                                                                                                                                                                                       | $1\frac{1}{4}$ and larger   |
| Locknuts - - - - -           | $\frac{1}{8}$                                                                                                                                | $\frac{1}{4}$ to $1\frac{1}{4}$ inclusive                                                                                                                                                                                                                                                          | $1\frac{1}{4}$ and larger   |
| Extension Pieces - - - - -   |                                                                                                                                              | All Sizes                                                                                                                                                                                                                                                                                          |                             |
| Waste Nuts - - - - -         |                                                                                                                                              | All Sizes                                                                                                                                                                                                                                                                                          |                             |
| Chandelier Hooks - - - - -   |                                                                                                                                              | All Sizes                                                                                                                                                                                                                                                                                          |                             |
| Wall Plates - - - - -        |                                                                                                                                              | All Sizes                                                                                                                                                                                                                                                                                          |                             |
| Pump Rod Couplings - - -     | $\frac{3}{8}$ , $\frac{7}{8}$ $\times$ $\frac{7}{16}$ , $\frac{1}{2}$                                                                        | $\frac{1}{2}$ and $\frac{3}{4}$                                                                                                                                                                                                                                                                    |                             |

Fittings in Class C having one or more outlets smaller than  $\frac{3}{4}$  will be charged in Class B.

Above prices on Galvanized Fittings are for Standard Sizes only. Other sizes will be made to order at a special price according to quantity ordered.

The run of Tees, (Bullheads), gives the size for the purpose of classification, and the outlet being larger does not change it.

IN ORDERING BE PARTICULAR TO MENTION BEADED OR PLAIN.

# MALLEABLE IRON UNIONS

Fig. 4405



Fig. 4408

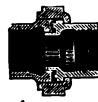


Fig. 4409



| Sizes - - - - inches        | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1   | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2    | $2\frac{1}{2}$ | 3    | $3\frac{1}{2}$ | 4    |
|-----------------------------|---------------|---------------|---------------|---------------|-----|----------------|----------------|------|----------------|------|----------------|------|
| Unions, fig. 4405 - - -     | \$0 18        | 20            | 22            | 27            | 33  | 46             | 58             | 75   | 1 55           | 2 10 | 3 65           | 4 35 |
| Unions, fig. 4405, galv'zd. | 27            | 30            | 33            | 40            | 50  | 70             | 90             | 1 15 | 2 35           | 3 15 | 5 50           | 6 50 |
| "American," } black - -     | 20            | 24            | 28            | 35            | 40  | 56             | 80             | 95   | 2 00           | 2 75 | ---            | ---  |
| fig. 4408 } galvanized      | 24            | 28            | 35            | 46            | 55  | 78             | 1 12           | 1 35 | 2 90           | 3 75 | ---            | ---  |
| } tinned - -                | 30            | 33            | 45            | 55            | 65  | 90             | 1 40           | 1 55 | ---            | ---  | ---            | ---  |
| "Keystone," } black - -     | 20            | 24            | 28            | 35            | 40  | 56             | 80             | 95   | ---            | ---  | ---            | ---  |
| fig. 4409 } galvanized      | 24            | 28            | 35            | 46            | 55  | 78             | 1 12           | 1 35 | ---            | ---  | ---            | ---  |
| } tinned - -                | 30            | 33            | 45            | 55            | 65  | 90             | 1 40           | 1 55 | ---            | ---  | ---            | ---  |
| Weight - - - - lbs.         | .2            | .27           | .5            | .72           | .94 | 1.4            | 1.8            | 2 8  | 3.5            | 5    | 7.8            | 5.8  |

Fig. 4416



# CAST IRON FLANGE UNIONS

PLAIN OR LIGHT PATTERN, Fig. 4416

Fig. 4414



With lip

| Sizes - - - - inches        | $\frac{1}{2}$  | $\frac{3}{4}$  | 1              | $1\frac{1}{4}$ | $1\frac{1}{2}$  | 2               | $2\frac{1}{2}$  | 3               | $3\frac{1}{2}$  |
|-----------------------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Diameter of flanges, inches | $2\frac{1}{8}$ | $3\frac{1}{8}$ | $3\frac{1}{2}$ | $3\frac{3}{8}$ | $4\frac{1}{2}$  | $5\frac{1}{8}$  | $6\frac{1}{8}$  | $6\frac{3}{4}$  | $7\frac{1}{4}$  |
| Number of bolts in each -   | 3              | 3              | 3              | 4              | 4               | 4               | 4               | 4               | 4               |
| Weight - - - - lbs.         | ---            | 1.9            | 2.1            | 2.5            | 3.7             | 6               | 7               | 9.5             | 11.5            |
| Black - - - - each          | \$0 40         | 46             | 52             | 64             | 78              | 1 00            | 1 25            | 1 50            | 1 80            |
| Galvanized - - - - "        | 80             | 92             | 1 04           | 1 28           | 1 56            | 2 00            | 2 50            | 3 00            | 3 60            |
| Sizes - - - - inches        | 4              | $4\frac{1}{2}$ | 5              | 6              | 7               | 8               | 9               | 10              | 12              |
| Diameter of flanges, inches | $7\frac{1}{8}$ | $8\frac{1}{2}$ | $9\frac{1}{8}$ | 10             | $11\frac{1}{8}$ | $12\frac{1}{2}$ | $13\frac{1}{4}$ | $15\frac{1}{8}$ | $17\frac{1}{2}$ |
| Number of bolts in each -   | 4              | 5              | 5              | 6              | 7               | 8               | 9               | 10              | 12              |
| Weight - - - - lbs.         | 15.5           | 19             | 23.5           | 28.5           | 35              | 45              | 57              | 62              | 118             |
| Black - - - - each          | \$2 10         | 2 70           | 3 15           | 3 95           | 5 50            | 7 00            | 10 00           | 11 50           | 16 00           |
| Galvanized - - - - "        | 4 20           | 5 40           | 6 30           | 7 90           | 11 00           | 14 00           | 20 00           | 23 00           | 32 00           |

# FLANGE UNIONS, WITH LIP, Fig. 4414

| Sizes - - - - inches        | $\frac{1}{2}$  | $\frac{3}{4}$  | 1              | $1\frac{1}{4}$  | $1\frac{1}{2}$  | 2               | $2\frac{1}{2}$  | 3               | $3\frac{1}{2}$ |
|-----------------------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|
| Diameter of flanges, inches | $3\frac{1}{8}$ | $3\frac{3}{8}$ | $3\frac{1}{2}$ | 4               | $4\frac{1}{8}$  | $5\frac{1}{8}$  | 6               | $6\frac{3}{4}$  | $7\frac{1}{8}$ |
| Number of bolts in each -   | 4              | 4              | 4              | 4               | 4               | 4               | 4               | 4               | 4              |
| Weight - - - - lbs.         | ---            | ---            | 2.8            | 3.8             | 5.3             | 7.3             | 10              | 11.5            | 15.3           |
| Black - - - - each          | \$0 60         | 75             | 90             | 1 00            | 1 20            | 1 50            | 1 75            | 2 00            | 2 75           |
| Galvanized - - - - "        | 1 00           | 1 25           | 1 50           | 1 65            | 2 00            | 2 50            | 2 90            | 3 35            | 4 55           |
| Sizes - - - - inches        | 4              | $4\frac{1}{2}$ | 5              | 6               | 7               | 8               | 9               | 10              | 12             |
| Diameter of flanges, inches | $8\frac{1}{8}$ | $8\frac{7}{8}$ | $9\frac{1}{8}$ | $10\frac{1}{4}$ | $11\frac{1}{8}$ | $13\frac{1}{8}$ | $14\frac{1}{8}$ | $15\frac{1}{4}$ | 18             |
| Number of bolts in each -   | 4              | 5              | 5              | 6               | 7               | 8               | 9               | 10              | 12             |
| Weight - - - - lbs.         | 19             | 23.5           | 29             | 36              | 46              | 50              | 80              | 100             | 140            |
| Black - - - - each          | \$3 00         | 3 50           | 4 00           | 5 00            | 7 00            | 10 00           | 15 00           | 17 50           | 20 00          |
| Galvanized - - - - "        | 5 00           | 5 85           | 6 65           | 8 35            | 11 65           | 16 65           | 25 00           | 29 00           | 34 00          |

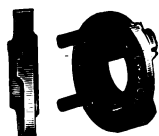


## CAST IRON FLANGE UNIONS

## OIL COUNTRY

## PATTERN

Fig. 4502



## FIVE BOLT

Fig. 4500

O.W.S. Co.



| Sizes - - - - - inches        | 1½               | 2                | 2½             | 3              | 3½             | 4              | 5              | 6              |
|-------------------------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Oil country pattern - - - - - | 4 bolt<br>\$1 20 | 4 bolt<br>1 50   | 4 bolt<br>1 75 | 4 bolt<br>2 00 | 5 bolt<br>2 75 | 5 bolt<br>3 00 | 5 bolt<br>4 00 | 6 bolt<br>5 00 |
| Weight - - - - - lbs.         | 6                | 7.5              | 10.5           | 13             | 23             | 25             | 27             | 33             |
| S. P. pattern - - - - -       |                  | 5 bolt<br>\$2 50 |                |                |                |                |                |                |
| Weight - - - - - lbs.         |                  | 11               |                |                |                |                |                |                |
| Extra heavy pattern - - - - - |                  | 5 bolt<br>\$3 00 |                |                |                |                |                |                |
| Weight - - - - - lbs.         |                  | 20               |                |                |                |                |                |                |

Fig. 4423

## BUSHINGS

Fig. 4424



NOTE.—Bushings reducing but one size, 2½ inches and smaller, are malleable.



|                      |               |               |               |     |                 |                 |     |                 |     |                 |
|----------------------|---------------|---------------|---------------|-----|-----------------|-----------------|-----|-----------------|-----|-----------------|
| Sizes - - inches     | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1   | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2   | 2 $\frac{1}{2}$ | 3   | 3 $\frac{1}{2}$ |
| Fig. 4423 - - -      | \$0 04        | 04            | 05            | 06  | 07              | 09              | 14  | 21              | 30  | 40              |
| Faced, fig. 4424 - - | 08            | 09            | 11            | 13  | 17              | 22              | 32  | 48              | 70  | 1 20            |
| Weight - - - lbs.    | .08           | .17           | .26           | .46 | .60             | 1               | 1.5 | 2.2             | 3.6 |                 |

|                        |        |                 |    |      |      |      |      |      |      |
|------------------------|--------|-----------------|----|------|------|------|------|------|------|
| Sizes - - - - inches   | 4      | 4 $\frac{1}{2}$ | 5  | 6    | 7    | 8    | 9    | 10   | 12   |
| Fig. 4423 - - - - -    | \$0 50 | 75              | 93 | 1 25 | 1 87 | 2 75 | 3 25 | 3 75 | 5 00 |
| Faced, fig. 4424 - - - | 1 50   |                 |    |      |      |      |      |      |      |
| Weight - - - - lbs.    | 4.5    | 6               | 7  | 12   | 13   | 15   | 15   | 18   | 26   |

Fig. 4427

## PLUGS

Fig. 4428



| Sizes - - inches    | $\frac{1}{4}$   | $\frac{3}{8}$ | $\frac{1}{2}$   | $\frac{3}{4}$ | 1    | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2    | 2 $\frac{1}{2}$ | 3     |
|---------------------|-----------------|---------------|-----------------|---------------|------|-----------------|-----------------|------|-----------------|-------|
| Fig. 4427 - - -     | \$0 02          | 02            | 02              | 03            | 04   | 05              | 07              | 10   | 18              | 25    |
| Solid - - -         | 04              | 04            | 04              | 06            | 08   | 09              | 11              | 15   | 27              | 38    |
| Weight - - lbs.     | .03             | .06           | .11             | .19           | .23  | .34             | .46             | .72  | 1.1             | 1.9   |
| Left hand - - -     | -----           | -----         | -----           | 06            | 08   | 09              | 11              | 15   | -----           | ----- |
| Socket, fig. 4428 - | -----           | -----         | 04              | 06            | 08   | 09              | 11              | 15   | -----           | ----- |
| Sizes - - inches    | 3 $\frac{1}{2}$ | 4             | 4 $\frac{1}{2}$ | 5             | 6    | 7               | 8               | 9    | 10              | 12    |
| Fig. 4427 - - -     | \$0 38          | 42            | 65              | 88            | 1 20 | 1 85            | 2 75            | 3 25 | 3 75            | 5 00  |
| Solid - - -         | 57              | 63            | 1 00            | 1 35          | 1 80 | 2 80            | 4 15            | 5 00 | 5 75            | 7 50  |
| Weight - - lbs.     | 2.5             | 3             | 3.9             | 6.5           | 8.5  | 11              | 16              | 24   | 30              | 41    |

**CASING FITTINGS****CAST IRON**

| Sizes                         | 2, 2¼,<br>2½, 3 | 3¼   | 3½,<br>3¾ | 4    | 4¼   | 4½    | 4¾    | 5     | 5½,<br>5¾ | 6¼,<br>6½ | 7½    | 8¼,<br>8½ | 9½    |
|-------------------------------|-----------------|------|-----------|------|------|-------|-------|-------|-----------|-----------|-------|-----------|-------|
| Elbows - - - - -              | \$1 10          | 1 35 | 1 80      | 2 50 | 2 50 | 3 00  | 3 00  | 3 50  | 4 00      | 7 00      | 10 00 | 13 00     | 20 00 |
| Elbows, reducing - - - - -    | 1 40            | 1 75 | 2 25      | 3 00 | 3 00 | 3 75  | 3 75  | 4 35  | 5 00      | 8 75      | 12 50 | 16 00     | 25 00 |
| 45° Elbows - - - - -          | 1 00            | 2 00 | 2 70      | 3 75 | 3 75 | 4 00  | 4 00  | 4 50  | 5 50      | 9 00      | 13 00 | 16 00     | 25 00 |
| Tees - - - - -                | 1 50            | 2 00 | 2 50      | 3 50 | 3 50 | 4 00  | 4 25  | 5 00  | 5 50      | 10 00     | 15 00 | 20 00     | 25 00 |
| Tees, reducing - - - - -      | 1 85            | 2 50 | 3 00      | 4 35 | 4 35 | 5 00  | 5 25  | 6 25  | 6 75      | 12 50     | 18 75 | 25 00     | 30 00 |
| Crosses - - - - -             | 2 20            | 2 70 | 3 50      | 5 00 | 5 00 | 5 70  | 6 00  | 7 00  | 7 80      | 14 00     | 20 00 | 26 00     | 40 00 |
| Crosses, reducing - - - - -   | 2 75            | 3 30 | 4 35      | 6 25 | 6 25 | 7 00  | 7 50  | 8 75  | 9 70      | 17 50     | 25 00 | 32 00     | 50 00 |
| Ys - - - - -                  | 3 25            | 4 50 | 6 00      | 8 00 | 8 00 | 9 00  | 9 00  | 10 00 | 12 00     | 17 00     | 25 00 | - - -     | - - - |
| Return bends, close - - - - - | 3 00            | 4 00 | 5 00      | 6 00 | 6 50 | - - - | - - - | - - - | - - -     | - - -     | - - - | - - -     | - - - |
| Return bends, open - - - - -  | 3 75            | 4 50 | 5 75      | 8 00 | 8 00 | - - - | - - - | - - - | - - -     | - - -     | - - - | - - -     | - - - |
| Flange unions - - - - -       | 2 25            | 2 75 | 3 15      | 4 50 | 4 50 | 5 00  | 5 00  | 5 50  | 6 50      | 8 00      | 10 00 | 12 00     | 15 00 |
| Reducers - - - - -            | 1 20            | 1 50 | 2 00      | 2 75 | 2 75 | 3 00  | 3 00  | 3 50  | 4 00      | 8 00      | 10 00 | 12 00     | 15 00 |
| Caps - - - - -                | 80              | 1 10 | 1 30      | 1 60 | 1 60 | 2 00  | 2 00  | 2 15  | 2 35      | 4 00      | 4 35  | 6 00      | 7 25  |
| Locknuts - - - - -            | 50              | 70   | 95        | 1 25 | 1 25 | 1 35  | 1 35  | 1 50  | 1 90      | 2 50      | 3 50  | 4 00      | 4 50  |
| Bushings - - - - -            | 60              | 80   | 1 00      | 1 50 | 1 50 | 1 85  | 1 85  | 2 00  | 2 50      | 3 75      | 5 50  | 6 50      | 7 50  |
| Plugs - - - - -               | 50              | 75   | 85        | 1 35 | 1 35 | 1 75  | 1 75  | 2 00  | 2 40      | 3 75      | 5 50  | 6 50      | 7 50  |

For list on Galvanized Casing Fittings, double above list.

NOTE.—Casing fittings, with one or more openings pipe thread, add 25 per cent.

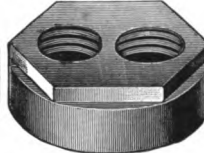
Fig. 4467



Fig. 4464



Fig. 4465

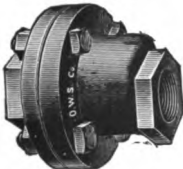
**CAST IRON TWO-HOLE CASING BUSHINGS AND ONE AND TWO-HOLE CAPS****TAPPED FOR TWO-INCH PIPE**

| Size - - - - - inches            | 5      | 5½   | 5¾   | 6¼   | 6¾   | 7¾   | 8¼   | 8¾   | 9¾    |
|----------------------------------|--------|------|------|------|------|------|------|------|-------|
| Bushings, fig. 4467 - - - - -    | \$3 25 | 3 50 | 3 75 | 5 75 | 6 00 | 6 50 | 8 50 | 9 00 | 10 50 |
| Weight - - - - - lbs.            | 4      | 5    | 6    | 8    | 12   | 15   | 17   | 20   | 25    |
| Caps, fig. 4464 & 4465 - - - - - | 3 25   | 3 50 | 3 75 | 5 75 | 6 00 | 6 50 | 8 50 | 9 00 | 10 50 |
| Weight - - - - - lbs.            | 6      | 9    | 13   | 14   | 18   | 24   | 28   | 32   | 42    |

**WROUGHT IRON CASING BUSHINGS**

| Size - - - - - inches | 5½ x 5 | 5¾ x 5 | 5¾ x 5½ | 6¼ x 5¾ | 6¾ x 6¼ |
|-----------------------|--------|--------|---------|---------|---------|
| Price - - - - -       | \$4 75 | 5 00   | 5 00    | 6 50    | 7 75    |

Fig. 2988

**BECKWITH SWING CHECK**

| Size - - - - - inches       | 2      | 3     | 4     |
|-----------------------------|--------|-------|-------|
| Regular - - - - -           | \$4 75 | 12 00 | 25 00 |
| Weight - - - - - lbs.       | 26     | 49    | 147   |
| With lead gaskets - - - - - | 8 00   | 15 00 | 32 00 |
| Weight - - - - - lbs.       | 41     | 74    | - - - |

Fig. 4418

**CUSHING'S PATENT FLANGE UNION**

| Size - - - - - inches | 2      | 2½   | 3    | 3¾   | 4     | 5     | 6     |
|-----------------------|--------|------|------|------|-------|-------|-------|
| Price - - - - -       | \$3 50 | 4 25 | 6 00 | 9 00 | 11 00 | 14 50 | 18 00 |
| Weight - - - - - lbs. | 7      | 12   | 26   | 44   | 67    | 80    | 101   |

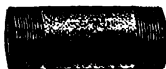
## WROUGHT IRON FITTINGS

Fig. 4433



Close

Fig. 4432



Long

Fig. 4431



Short

NIPPLES—Figs. 4431, 4432, 4433

THREADED RIGHT HAND

| LENGTH IN INCHES      |                       |                                        | Sizes          | PRICES               |       | PRICES OF EXTRA LONG NIPPLES |    |    |      |      |       |       |       |       |  |  |
|-----------------------|-----------------------|----------------------------------------|----------------|----------------------|-------|------------------------------|----|----|------|------|-------|-------|-------|-------|--|--|
| Close<br>Fig.<br>4433 | Short<br>Fig.<br>4431 | Long<br>Fig. 4432                      |                | Close<br>or<br>Short | Long  | Length in inches             |    |    |      |      |       |       |       |       |  |  |
|                       |                       |                                        |                |                      |       | 4                            | 5  | 6  | 7    | 8    | 9     | 10    | 11    | 12    |  |  |
| $\frac{3}{4}$         | $1\frac{1}{2}$        | 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$  | $\frac{1}{8}$  | \$0 04               | 06    | 07                           | 08 | 10 | 12   | 14   | 15    | 17    | 18    | 19    |  |  |
| $\frac{7}{8}$         | $1\frac{1}{2}$        | 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$  | $\frac{1}{4}$  | 04                   | 06    | 07                           | 08 | 10 | 12   | 14   | 15    | 17    | 18    | 19    |  |  |
| 1                     | $1\frac{1}{2}$        | 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$  | $\frac{3}{8}$  | 04                   | 06    | 07                           | 08 | 10 | 12   | 14   | 15    | 17    | 18    | 19    |  |  |
| $1\frac{1}{8}$        | $1\frac{1}{2}$        | 2, $2\frac{1}{2}$ , 3, $3\frac{1}{2}$  | $\frac{1}{2}$  | 05                   | 07    | 08                           | 10 | 12 | 14   | 16   | 18    | 20    | 22    | 23    |  |  |
| $1\frac{3}{8}$        | 2                     | $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4 | $\frac{3}{4}$  | 06                   | 09    | --                           | 11 | 13 | 17   | 18   | 20    | 22    | 24    | 26    |  |  |
| $1\frac{1}{2}$        | 2                     | $2\frac{1}{2}$ , 3, $3\frac{1}{2}$ , 4 | 1              | 08                   | 13    | --                           | 15 | 18 | 23   | 25   | 28    | 31    | 34    | 36    |  |  |
| $1\frac{5}{8}$        | $2\frac{1}{2}$        | 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2}$  | $1\frac{1}{4}$ | 11                   | 17    | --                           | 20 | 24 | 29   | 33   | 36    | 40    | 44    | 47    |  |  |
| $1\frac{3}{4}$        | $2\frac{1}{2}$        | 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2}$  | $1\frac{1}{2}$ | 13                   | 20    | --                           | 25 | 29 | 36   | 40   | 45    | 50    | 54    | 59    |  |  |
| 2                     | $2\frac{1}{2}$        | 3, $3\frac{1}{2}$ , 4, $4\frac{1}{2}$  | 2              | 18                   | 27    | --                           | 32 | 38 | 50   | 54   | 59    | 65    | 72    | 77    |  |  |
| $2\frac{1}{2}$        | 3                     | $3\frac{1}{2}$ , 4, $4\frac{1}{2}$ , 5 | $2\frac{1}{2}$ | 39                   | 59    | --                           | -- | 68 | 90   | 97   | 1 06  | 1 17  | 1 26  | 1 35  |  |  |
| $2\frac{1}{2}$        | 3                     | $3\frac{1}{2}$ , 4, $4\frac{1}{2}$ , 5 | 3              | 48                   | 72    | --                           | -- | 85 | 1 08 | 1 20 | 1 33  | 1 45  | 1 58  | 1 70  |  |  |
| $2\frac{3}{4}$        | 4                     | $4\frac{1}{2}$ , 5, $5\frac{1}{2}$ , 6 | $3\frac{1}{2}$ | 75                   | 1 05  | --                           | -- | -- | 1 30 | 1 45 | 1 60  | 1 75  | 1 90  | 2 05  |  |  |
| 3                     | 4                     | $4\frac{1}{2}$ , 5, $5\frac{1}{2}$ , 6 | 4              | 85                   | 1 20  | --                           | -- | -- | 1 52 | 1 69 | 1 87  | 2 05  | 2 22  | 2 40  |  |  |
| 3                     | 4                     | $4\frac{1}{2}$ , 5, $5\frac{1}{2}$ , 6 | $4\frac{1}{2}$ | 1 25                 | 1 70  | --                           | -- | -- | 2 25 | 2 50 | 2 75  | 2 95  | 3 17  | 3 40  |  |  |
| $3\frac{1}{2}$        | $4\frac{1}{2}$        | 5, $5\frac{1}{2}$ , 6, $6\frac{1}{2}$  | 5              | 1 55                 | 2 45  | --                           | -- | -- | 2 58 | 2 83 | 3 10  | 3 35  | 3 60  | 3 85  |  |  |
| $3\frac{1}{2}$        | $4\frac{1}{2}$        | 5, $5\frac{1}{2}$ , 6, $6\frac{1}{2}$  | 6              | 1 85                 | 2 90  | --                           | -- | -- | 3 05 | 3 35 | 3 70  | 4 00  | 4 30  | 4 65  |  |  |
| 4                     | 5                     | 6                                      | 7              | 3 20                 | 3 60  | --                           | -- | -- | 4 05 | 4 45 | 4 90  | 5 30  | 5 75  | 6 15  |  |  |
| 4                     | 5                     | 6                                      | 8              | 3 55                 | 4 05  | --                           | -- | -- | 4 55 | 5 05 | 5 50  | 6 00  | 6 50  | 7 00  |  |  |
| 5                     | 6                     | 8                                      | 9              | 5 25                 | 6 50  | --                           | -- | -- | ---  | ---  | 7 10  | 7 75  | 8 40  | 9 00  |  |  |
| 5                     | 6                     | 8                                      | 10             | 6 75                 | 8 25  | --                           | -- | -- | ---  | ---  | 8 90  | 9 70  | 10 40 | 11 15 |  |  |
| --                    | --                    | -----                                  | 11             | ----                 | ----- | --                           | -- | -- | ---- | ---- | ----- | ----- | ----- | ----- |  |  |
| 5                     | 6                     | 8                                      | 12             | 8 00                 | 10 00 | --                           | -- | -- | ---- | ---- | 10 80 | 11 75 | 12 70 | 13 65 |  |  |

Nipples made to order from Extra Heavy Pipe at double the lists above.

## CASING NIPPLES

| Size - - - - inches    | 3      | 3 $\frac{1}{4}$ | 3 $\frac{1}{2}$ | 3 $\frac{3}{4}$ | 4    | 4 $\frac{1}{4}$ | 4 $\frac{1}{2}$ | 4 $\frac{3}{4}$ | 5    |
|------------------------|--------|-----------------|-----------------|-----------------|------|-----------------|-----------------|-----------------|------|
| Close or short - - - - | \$1 90 | 1 95            | 2 30            | 2 35            | 2 35 | 2 40            | 2 40            | 2 45            | 2 55 |
| Long - - - - -         | 2 00   | 2 10            | 2 45            | 2 50            | 2 50 | 2 60            | 2 60            | 2 70            | 2 85 |
| 6 inches long - - - -  | 2 05   | ---             | ---             | ---             | ---  | ---             | ---             | ---             | ---  |
| 7 inches long - - - -  | 2 10   | 2 15            | 2 50            | 2 60            | 2 60 | 2 70            | 2 70            | 2 80            | 2 95 |
| 8 inches long - - - -  | 2 15   | 2 20            | 2 60            | 2 65            | 2 75 | 2 80            | 2 80            | 2 95            | 3 10 |
| 9 inches long - - - -  | 2 25   | 2 30            | 2 65            | 2 75            | 2 80 | 2 90            | 2 90            | 3 05            | 3 25 |
| 10 inches long - - - - | 2 30   | 2 35            | 2 70            | 2 85            | 2 90 | 3 00            | 3 00            | 3 15            | 3 40 |
| 11 inches long - - - - | 2 35   | 2 40            | 2 80            | 2 90            | 3 00 | 3 05            | 3 10            | 3 25            | 3 55 |
| 12 inches long - - - - | 2 40   | 2 50            | 2 85            | 3 00            | 3 10 | 3 15            | 3 20            | 3 35            | 3 65 |

| Size - - - - inches    | 5 $\frac{3}{8}$ | 5 $\frac{7}{8}$ | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 7 $\frac{1}{8}$ | 8 $\frac{1}{4}$ | 8 $\frac{3}{8}$ | 9 $\frac{1}{8}$ |      |
|------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------|
| Close or short - - - - | \$3 00          | 3 25            | 3 45            | 4 50            | 4 50            | 5 25            | 6 45            | 7 10            | ---- |
| Long - - - - -         | 3 30            | 3 50            | ---             | ---             | ---             | ---             | ---             | ---             | ---- |
| 6 inches long - - - -  | ---             | ---             | 3 80            | 4 80            | 4 75            | 5 45            | ---             | ---             | ---- |
| 7 inches long - - - -  | 3 50            | 3 65            | 4 00            | 5 05            | 5 00            | 5 70            | 6 70            | 7 45            | ---- |
| 8 inches long - - - -  | 3 65            | 3 80            | 4 20            | 5 30            | 5 25            | 5 95            | 7 00            | 7 80            | ---- |
| 9 inches long - - - -  | 3 80            | 3 95            | 4 35            | 5 55            | 5 45            | 6 20            | 7 30            | 8 15            | ---- |
| 10 inches long - - - - | 4 00            | 4 10            | 4 55            | 5 80            | 5 70            | 6 45            | 7 60            | 8 50            | ---- |
| 11 inches long - - - - | 4 15            | 4 25            | 4 75            | 6 05            | 5 95            | 6 70            | 7 90            | 8 85            | ---- |
| 12 inches long - - - - | 4 30            | 4 40            | 4 95            | 6 30            | 6 20            | 6 95            | 8 20            | 9 20            | ---- |

Fig. 4435

Casing substitute nipples, or nipples made of line pipe or tubing, same list as above. Casing nipples over 12 inches long, charge net price of casing and two threads.



## WROUGHT IRON SWEDGED NIPPLE

## PIPE SIZES

| Size - - inches | 2x1    | 2x1 $\frac{1}{4}$ | 2x1 $\frac{1}{2}$ | 2 $\frac{1}{2}$ x1 $\frac{1}{2}$ | 2 $\frac{1}{2}$ x2 | 3x1  | 3x1 $\frac{1}{2}$ | 3x2  | 3x2 $\frac{1}{2}$ | 3 $\frac{1}{2}$ x2 | 3 $\frac{1}{2}$ x2 $\frac{1}{2}$ | 3 $\frac{1}{2}$ x3 |
|-----------------|--------|-------------------|-------------------|----------------------------------|--------------------|------|-------------------|------|-------------------|--------------------|----------------------------------|--------------------|
| Price - - - -   | \$1 15 | 1 10              | 1 00              | 1 25                             | 1 15               | 2 25 | 2 00              | 1 75 | 1 65              | 2 00               | 1 85                             | 1 75               |
| Weight - - lbs. | 3.6    | 3.6               | 3.6               | 5.7                              | 5.7                | 7.5  | 7.5               | 7.5  | 7.5               | 9.0                | 9.0                              | 9.0                |

| Size - - inches | 4x1    | 4x2  | 4x2 $\frac{1}{2}$ | 4x3  | 4x3 $\frac{1}{2}$ | 4 $\frac{1}{2}$ x2 | 4 $\frac{1}{2}$ x2 $\frac{1}{2}$ | 4 $\frac{1}{2}$ x3 | 4 $\frac{1}{2}$ x4 | 5x2  | 5x2 $\frac{1}{2}$ | 5x3  |
|-----------------|--------|------|-------------------|------|-------------------|--------------------|----------------------------------|--------------------|--------------------|------|-------------------|------|
| Price - - - -   | \$3 75 | 2 75 | 2 50              | 2 25 | 2 15              | 3 00               | 2 85                             | 2 75               | 2 50               | 4 00 | 3 75              | 3 50 |
| Weight - - lbs. | 10.5   | 10.5 | 10.5              | 10.5 | 10.5              | 12.5               | 12.5                             | 12.5               | 12.5               | 14.5 | 14.5              | 14.5 |

| Size - - inches | 5x3 $\frac{1}{2}$ | 5x4  | 5x4 $\frac{1}{2}$ | 6x2  | 6x2 $\frac{1}{2}$ | 6x3  | 6x3 $\frac{1}{2}$ | 6x4  | 6x4 $\frac{1}{2}$ | 6x5  | 7x4  | 7x5  |
|-----------------|-------------------|------|-------------------|------|-------------------|------|-------------------|------|-------------------|------|------|------|
| Price - - - -   | \$3 35            | 3 25 | 3 00              | 5 50 | 5 25              | 5 10 | 5 00              | 4 75 | 4 50              | 4 25 | 6 75 | 6 50 |
| Weight - - lbs. | 14.5              | 14.5 | 14.5              | 18.8 | 18.8              | 18.8 | 18.8              | 18.8 | 18.8              | 18.8 | 23.3 | 23.3 |

| Size - - inches | 7x6    | 8x3  | 8x4  | 8x6  | 10x4  | 10x6  | 10x8  | 12x4  | 12x6  | 12x8  | 12x10 |
|-----------------|--------|------|------|------|-------|-------|-------|-------|-------|-------|-------|
| Price - - - -   | \$6 00 | 8 50 | 8 25 | 7 50 | 15 00 | 13 50 | 12 00 | 22 00 | 20 00 | 18 25 | 16 75 |
| Weight - - lbs. | 23.3   | 28.0 | 28.0 | 28.0 | 60.0  | 60.0  | 60.0  | 72.0  | 72.0  | 72.0  | 72.0  |

## CASING SIZES

| Size, inches        | Weight, lbs.     | Each   | Size, inches                      | Weight, lbs.     | Each   | Size, inches                      | Weight, lbs. | Each   |
|---------------------|------------------|--------|-----------------------------------|------------------|--------|-----------------------------------|--------------|--------|
| 4 x3                | 8                | \$4 00 | 5 $\frac{3}{8}$ x4 $\frac{1}{2}$  | 12 $\frac{1}{2}$ | \$5 00 | 6 $\frac{3}{8}$ x3                | 17           | \$8 50 |
| 4 $\frac{1}{4}$ x2  | 8 $\frac{1}{2}$  | 4 75   | 5 $\frac{3}{8}$ x5                | 12 $\frac{1}{2}$ | 5 50   | 6 $\frac{3}{8}$ x4                | 17           | 8 00   |
| 5 x2                | 10               | 5 00   | 5 $\frac{3}{8}$ x5 $\frac{3}{16}$ | 12 $\frac{1}{2}$ | 7 00   | 6 $\frac{3}{8}$ x5                | 17           | 7 00   |
| 5 x3                | 10               | 4 50   | 6 $\frac{1}{4}$ x2                | 13 $\frac{1}{2}$ | 6 00   | 6 $\frac{3}{8}$ x5 $\frac{3}{16}$ | 17           | 7 00   |
| 5 x3 $\frac{1}{2}$  | 10               | 4 50   | 6 $\frac{1}{4}$ x3                | 13 $\frac{1}{2}$ | 5 50   | 6 $\frac{3}{8}$ x6 $\frac{1}{4}$  | 17           | 6 00   |
| 5 x4                | 10               | 4 00   | 6 $\frac{1}{4}$ x4                | 13 $\frac{1}{2}$ | 5 50   | 8 $\frac{1}{4}$ x5                | 24           | 8 00   |
| 5 $\frac{3}{16}$ x2 | 12 $\frac{1}{2}$ | 6 50   | 6 $\frac{1}{4}$ x5                | 13 $\frac{1}{2}$ | 5 25   | 8 $\frac{1}{4}$ x6 $\frac{1}{4}$  | 24           | 8 50   |
| 5 $\frac{3}{16}$ x3 | 12 $\frac{1}{2}$ | 5 50   | 6 $\frac{1}{4}$ x5 $\frac{3}{16}$ | 13 $\frac{1}{2}$ | 5 50   | 8 $\frac{1}{4}$ x6 $\frac{3}{8}$  | 24           | 8 00   |
| 5 $\frac{3}{16}$ x5 | 12 $\frac{1}{2}$ | 4 00   | 6 $\frac{1}{4}$ x5 $\frac{7}{8}$  | 13 $\frac{1}{2}$ | 6 00   | -----                             | -----        | -----  |
| 5 $\frac{3}{8}$ x4  | 12 $\frac{1}{2}$ | 4 50   | 6 $\frac{3}{8}$ x2                | 17               | 15 00  | -----                             | -----        | -----  |

## PIPE CUTTING AND THREADING

| Size - - - - - inches               | $\frac{1}{8}$   | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2    | 2 $\frac{1}{2}$ | 3  | 3 $\frac{1}{2}$ | 4  |
|-------------------------------------|-----------------|---------------|---------------|---------------|---------------|------|-----------------|-----------------|------|-----------------|----|-----------------|----|
| Per thread, including cut - - - - - | \$0 06          | 06            | 06            | 06            | 10            | 10   | 15              | 15              | 20   | 35              | 35 | 45              | 50 |
| Size - - - - - inches               | 4 $\frac{1}{2}$ | 5             | 6             | 7             | 8             | 9    | 10              | 12              | 14   | 15              |    |                 |    |
| Per thread, including cut - - - - - | \$0 75          | 1 00          | 1 00          | 1 10          | 1 20          | 2 00 | 2 50            | 3 50            | 6 50 | 7 50            |    |                 |    |

## CASING AND DRIVE PIPE, CUTTING AND THREADING

|                                     |                                   |                                   |                                      |                                   |        |
|-------------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|--------|
| Size - - - - - inches               | 3 & 3 $\frac{1}{4}$               | 4 $\frac{1}{4}$ & 4 $\frac{1}{2}$ | 5, 5 $\frac{3}{8}$ & 5 $\frac{5}{8}$ | 6 $\frac{1}{4}$ & 6 $\frac{3}{8}$ |        |
| Per thread, including cut - - - -   | \$0 35                            | 50                                | 1 00                                 | 1 15                              |        |
| Size - - - - - inches               | 7 $\frac{1}{4}$ & 7 $\frac{3}{8}$ | 8 $\frac{1}{4}$ & 8 $\frac{3}{8}$ | 9 $\frac{3}{8}$                      | 8 D P                             | 10 D P |
| Per thread, including cut - - - - - | \$1 75                            | 2 50                              | 3 50                                 | 2 50                              | 3 50   |

## PIPE COUPLING

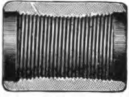
Fig. 4440



| Size of pipe, inches | Outside diameter, inches | Length, inches  | Weight, lbs. | Black, each | Galvanized, each | Right and left, black, each |
|----------------------|--------------------------|-----------------|--------------|-------------|------------------|-----------------------------|
| $\frac{1}{8}$        | $\frac{1}{8}$            | $\frac{1}{8}$   | .031         | \$0 05      | 06               | 07                          |
| $\frac{1}{4}$        | $\frac{1}{4}$            | $\frac{1}{4}$   | .046         | 05          | 06               | 07                          |
| $\frac{3}{8}$        | $\frac{3}{8}$            | $\frac{1}{2}$   | .078         | 06          | 08               | 08                          |
| $\frac{1}{2}$        | 1                        | 1 $\frac{1}{8}$ | .124         | 07          | 10               | 11                          |
| $\frac{3}{4}$        | 1 $\frac{3}{8}$          | 1 $\frac{1}{8}$ | .25          | 10          | 13               | 15                          |
| 1                    | 1 $\frac{5}{8}$          | 1 $\frac{1}{8}$ | .455         | 13          | 18               | 20                          |
| 1 $\frac{1}{4}$      | 1 $\frac{7}{8}$          | 2 $\frac{1}{8}$ | .562         | 17          | 25               | 25                          |
| 1 $\frac{1}{2}$      | 2 $\frac{1}{8}$          | 2 $\frac{3}{8}$ | .8           | 21          | 32               | 30                          |
| 2                    | 2 $\frac{3}{8}$          | 2 $\frac{7}{8}$ | 1.25         | 28          | 40               | 50                          |
| 2 $\frac{1}{2}$      | 3 $\frac{1}{8}$          | 2 $\frac{7}{8}$ | 1.76         | 40          | 55               | 85                          |
| 3                    | 3 $\frac{3}{8}$          | 3 $\frac{1}{8}$ | 2.63         | 60          | 80               | 1 20                        |
| 3 $\frac{1}{2}$      | 4 $\frac{1}{8}$          | 3 $\frac{3}{8}$ | 4.           | 80          | 1 05             | 1 60                        |
| 4                    | 5                        | 3 $\frac{7}{8}$ | 4.13         | 1 00        | 1 40             | 2 00                        |
| 4 $\frac{1}{2}$      | 5 $\frac{1}{2}$          | 3 $\frac{7}{8}$ | 4.87         | 1 50        | 2 00             | 8 20                        |
| 5                    | 6 $\frac{1}{8}$          | 4 $\frac{1}{8}$ | 8.44         | 1 65        | 2 25             | 9 00                        |
| 6                    | 7 $\frac{1}{8}$          | 4 $\frac{1}{8}$ | 10.63        | 2 40        | 3 25             | 12 50                       |
| 7                    | 8 $\frac{1}{8}$          | 4 $\frac{1}{8}$ | 11.27        | 3 25        | 4 20             | 13 00                       |
| 8                    | 9 $\frac{1}{8}$          | 4 $\frac{1}{8}$ | 15.15        | 4 25        | 5 50             | 17 00                       |
| 9                    | 10 $\frac{1}{8}$         | 5 $\frac{1}{8}$ | 17.82        | 5 50        | 7 00             | 17 50                       |
| 10                   | 11 $\frac{1}{8}$         | 6 $\frac{1}{8}$ | 27.7         | 7 50        | 9 75             | 23 00                       |
| 12                   | 13 $\frac{1}{8}$         | 6 $\frac{1}{8}$ | 43.18        | 10 00       | 13 65            | 28 00                       |
| 13                   | 15 $\frac{1}{8}$         | 6 $\frac{1}{8}$ | 49.28        | 12 50       | 16 50            | -----                       |
| 14                   | 16 $\frac{3}{8}$         | 6 $\frac{1}{8}$ | 63.27        | 18 75       | 23 85            | -----                       |
| 15                   | 17 $\frac{3}{8}$         | 6 $\frac{1}{8}$ | 66.          | 25 00       | 30 25            | -----                       |

These tables are substantially correct but are subject to slight variations, which may be made without notice.

Fig. 4442

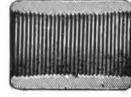


With sleeve

## COUPLINGS

FOR TUBING, LINE PIPE, AND DRIVE PIPE

Fig. 4441



| Size of tubing, inches | Outside diameter, inches | Length, inches | Weight, pounds | Plain, each | Galvanized, each | Plain, r. and l., each | Galvanized, r. and l., each |
|------------------------|--------------------------|----------------|----------------|-------------|------------------|------------------------|-----------------------------|
| $\frac{1}{2}$          | $1\frac{5}{8}$           | $1\frac{5}{8}$ | .29            | \$0 10      | \$0 14           | \$0 15                 | \$0 21                      |
| $\frac{3}{4}$          | $1\frac{7}{8}$           | $1\frac{7}{8}$ | .41            | 12          | 16               | 18                     | 25                          |
| 1                      | $2\frac{1}{8}$           | $2\frac{1}{8}$ | .64            | 15          | 21               | 23                     | 31                          |
| $1\frac{1}{4}$         | $2\frac{3}{8}$           | $2\frac{3}{8}$ | 1.10           | 25          | 37               | 38                     | 53                          |
| $1\frac{1}{2}$         | $2\frac{5}{8}$           | $2\frac{5}{8}$ | 1.18           | 30          | 46               | 45                     | 63                          |
| 2                      | $3\frac{1}{8}$           | $3\frac{1}{8}$ | 2.5            | 40          | 57               | 70                     | 98                          |
| $2\frac{1}{2}$         | $3\frac{3}{8}$           | $3\frac{3}{8}$ | 3.12           | 60          | 85               | 1 20                   | 1 70                        |
| 3                      | $4\frac{1}{8}$           | $3\frac{3}{4}$ | 3.85           | 80          | 1 15             | 1 60                   | 2 25                        |
| $3\frac{1}{2}$         | $4\frac{3}{8}$           | $4\frac{1}{8}$ | 5.             | 1 30        | 1 90             | 2 60                   | 3 65                        |
| 4                      | $5\frac{1}{8}$           | $4\frac{3}{8}$ | 6.5            | 1 50        | 2 15             | 3 00                   | 4 20                        |
| $4\frac{1}{2}$         | $5\frac{3}{8}$           | $4\frac{5}{8}$ | 7.7            | 2 00        | 2 85             | 7 75                   | 9 15                        |
| 5                      | $6\frac{1}{8}$           | $4\frac{7}{8}$ | 11.21          | 2 40        | 3 45             | 8 50                   | 10 50                       |
| 6                      | $7\frac{1}{8}$           | $4\frac{7}{8}$ | 12.            | 2 80        | 4 00             | 9 75                   | 12 00                       |
| 7                      | $8\frac{1}{8}$           | $6\frac{5}{8}$ | 14.75          | 3 85        | 5 55             | 10 00                  | 12 75                       |
| 8                      | $9\frac{1}{8}$           | $6\frac{5}{8}$ | 23.25          | 4 00        | 5 80             | 11 50                  | 15 75                       |
| 9                      | $10\frac{1}{8}$          | $6\frac{5}{8}$ | 26.48          | 5 00        | 7 25             | 12 00                  | 16 75                       |
| 10                     | $11\frac{1}{8}$          | $6\frac{5}{8}$ | 29.50          | 6 00        | 8 75             | 14 75                  | 20 25                       |
| 12                     | $13\frac{1}{8}$          | $6\frac{5}{8}$ | 39.5           | 8 00        | 11 15            | 18 25                  | 25 50                       |
| 13                     | $15\frac{1}{8}$          | $6\frac{5}{8}$ | 46.            | 10 00       | 13 75            | - - -                  | - - -                       |
| 14                     | $16\frac{1}{8}$          | $6\frac{5}{8}$ | 59.75          | 13 00       | 17 75            | - - -                  | - - -                       |
| 15                     | $17\frac{1}{8}$          | $6\frac{5}{8}$ | 62.25          | 20 00       | 25 00            | - - -                  | - - -                       |

## CASING COUPLING WITH SLEEVE

| Nominal inside diam. casing, inches | Outside diameter, inches | Length, inches | Weight, pounds | Plain, each | Galvanized, each | R. & L., each. |
|-------------------------------------|--------------------------|----------------|----------------|-------------|------------------|----------------|
| 2                                   | $2\frac{3}{4}$           | $2\frac{9}{8}$ | 1.31           | \$0 16      | \$0 23           | \$1 70         |
| $2\frac{1}{2}$                      | 3                        | $2\frac{9}{8}$ | 1.5            | 20          | 28               | 1 80           |
| $2\frac{3}{4}$                      | $3\frac{1}{4}$           | $2\frac{9}{8}$ | 1.62           | 25          | 35               | 2 00           |
| $2\frac{7}{8}$                      | $3\frac{1}{2}$           | $2\frac{9}{8}$ | 1.75           | 30          | 42               | 2 10           |
| 3                                   | $3\frac{3}{8}$           | $3\frac{1}{8}$ | 2.62           | 35          | 50               | 2 50           |
| $3\frac{1}{4}$                      | 4                        | $3\frac{1}{8}$ | 2.87           | 40          | 57               | 2 60           |
| $3\frac{1}{2}$                      | $4\frac{1}{4}$           | $3\frac{1}{8}$ | 3.06           | 46          | 65               | 3 00           |
| $3\frac{3}{4}$                      | $4\frac{1}{2}$           | $3\frac{1}{8}$ | 3.25           | 52          | 73               | 3 10           |
| 4                                   | $4\frac{3}{4}$           | $3\frac{9}{8}$ | 3.62           | 60          | 85               | 3 70           |
| $4\frac{1}{4}$                      | 5                        | $3\frac{9}{8}$ | 3.93           | 68          | 1 00             | 3 95           |
| $4\frac{1}{2}$                      | $5\frac{1}{8}$           | $3\frac{9}{8}$ | 4.06           | 74          | 1 05             | 4 55           |
| $4\frac{3}{4}$                      | $5\frac{3}{8}$           | $3\frac{9}{8}$ | 4.93           | 80          | 1 15             | 4 85           |
| 5                                   | $5\frac{1}{2}$           | $3\frac{9}{8}$ | 5.68           | 90          | 1 30             | 5 25           |
| $5\frac{1}{8}$                      | $6\frac{1}{8}$           | $3\frac{9}{8}$ | 5.93           | 1 00        | 1 40             | 5 50           |
| $5\frac{3}{8}$                      | $6\frac{3}{8}$           | $4\frac{1}{8}$ | 6.37           | 1 20        | 1 70             | 6 10           |
| $6\frac{1}{4}$                      | $7\frac{1}{8}$           | $4\frac{1}{8}$ | 7.93           | 1 35        | 1 90             | 6 45           |
| $6\frac{3}{8}$                      | $7\frac{3}{8}$           | $4\frac{1}{8}$ | 9.68           | 1 50        | 2 15             | 7 10           |
| $7\frac{1}{4}$                      | $8\frac{1}{8}$           | $4\frac{1}{8}$ | 9.93           | 1 65        | 2 35             | 7 55           |
| $7\frac{3}{8}$                      | $8\frac{3}{8}$           | $4\frac{1}{8}$ | 14.            | 1 75        | 2 50             | 8 30           |
| $8\frac{1}{4}$                      | 9                        | $4\frac{1}{8}$ | 15.37          | 2 25        | 3 25             | 9 30           |
| $8\frac{3}{8}$                      | $9\frac{1}{8}$           | $4\frac{1}{8}$ | 15.93          | 2 85        | 3 75             | 10 25          |
| $9\frac{1}{8}$                      | $10\frac{1}{8}$          | $4\frac{1}{8}$ | 24.6           | 3 50        | 5 00             | 11 80          |
| $10\frac{1}{8}$                     | $11\frac{1}{8}$          | $6\frac{1}{8}$ | 27.83          | 4 50        | 6 15             | 13 25          |
| $11\frac{1}{8}$                     | $12\frac{1}{8}$          | $6\frac{1}{8}$ | 29.75          | 5 15        | 6 95             | 14 25          |
| $12\frac{1}{8}$                     | 14                       | $6\frac{1}{8}$ | 35.            | 6 75        | 8 85             | 16 80          |
| $13\frac{1}{8}$                     | 15                       | $6\frac{1}{8}$ | 42.5           | 7 60        | 10 15            | 18 65          |
| $14\frac{1}{8}$                     | $16\frac{1}{8}$          | $6\frac{1}{8}$ | 50.            | 8 75        | 11 75            | 21 00          |
| $15\frac{1}{8}$                     | $17\frac{1}{8}$          | $6\frac{1}{8}$ | 52.5           | 10 00       | 13 15            | 22 25          |

These tables are substantially correct but are subject to slight variations, which may be made without notice.

**MERCHANT PIPE****BUTT AND LAP WELDED  
BLACK AND GALVANIZED**

| Size, nominal inside diameter, inches | Price per foot       | Nominal thickness, inches | Nominal weight per foot, lbs. | No. of threads per inch of screw |
|---------------------------------------|----------------------|---------------------------|-------------------------------|----------------------------------|
| $\frac{1}{8}$                         | \$0 05 $\frac{1}{2}$ | .068                      | .24                           | 27                               |
| $\frac{1}{4}$                         | 05 $\frac{1}{2}$     | .088                      | .42                           | 18                               |
| $\frac{3}{8}$                         | 05 $\frac{1}{2}$     | .091                      | .56                           | 18                               |
| $\frac{1}{2}$                         | 08 $\frac{1}{2}$     | .109                      | .84                           | 14                               |
| $\frac{3}{4}$                         | 11 $\frac{1}{2}$     | .113                      | 1.12                          | 14                               |
| 1                                     | 16 $\frac{1}{2}$     | .134                      | 1.67                          | 11 $\frac{1}{2}$                 |
| 1 $\frac{1}{4}$                       | 22 $\frac{1}{2}$     | .140                      | 2.24                          | 11 $\frac{1}{2}$                 |
| 1 $\frac{1}{2}$                       | 27                   | .145                      | 2.68                          | 11 $\frac{1}{2}$                 |
| 2                                     | 36                   | .154                      | 3.61                          | 11 $\frac{1}{2}$                 |
| 2 $\frac{1}{2}$                       | 57 $\frac{1}{2}$     | .204                      | 5.74                          | 8                                |
| 3                                     | 75 $\frac{1}{2}$     | .217                      | 7.54                          | 8                                |
| 3 $\frac{1}{2}$                       | 95                   | .226                      | 9.00                          | 8                                |
| 4                                     | 1 08                 | .237                      | 10.66                         | 8                                |
| 4 $\frac{1}{2}$                       | 1 30                 | .246                      | 12.49                         | 8                                |
| 5                                     | 1 45                 | .259                      | 14.50                         | 8                                |
| 6                                     | 1 88                 | .280                      | 18.76                         | 8                                |
| 7                                     | 2 35                 | .301                      | 23.27                         | 8                                |
| 8                                     | 2 82                 | .322                      | 28.18                         | 8                                |
| 9                                     | 3 40                 | .344                      | 33.70                         | 8                                |
| 10                                    | 4 25                 | .366                      | 40.00                         | 8                                |
| 11                                    | 4 75                 | .375                      | 45.00                         | 8                                |
| 12                                    | 5 20                 | .375                      | 49.00                         | 8                                |
| 13                                    | ----                 | .375                      | 54.00                         | 8                                |
| 14                                    | ----                 | .375                      | 58.00                         | 8                                |
| 15                                    | ----                 | .375                      | 62.00                         | 8                                |

No allowance made for pipe lighter than above weights.

Unless otherwise ordered, black pipe, random lengths, with threads and couplings, will be shipped.

For cut lengths an extra charge will be made above random lengths.

For pipe smoothed on the inside, known as plugged and reamed, an extra charge will be made above regular pipe.

For galvanized pipe an extra charge will be made above black.

For asphalted pipe an extra charge will be made above black.

**LARGE O. D. PIPE****PLAIN ENDS**

Revised and adopted May 1, 1902

| Size, O. D. | $\frac{1}{4}$ -inch thick | $\frac{5}{16}$ -inch thick | $\frac{3}{8}$ -inch thick | $\frac{7}{16}$ -inch thick | $\frac{1}{2}$ -inch thick |
|-------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| 14          | \$3 85                    | 4.80                       | 5.75                      | 6.65                       | 7.60                      |
| 15          | 4 15                      | 5.15                       | 6.15                      | 7.15                       | 8.15                      |
| 16          | 4 40                      | 5.50                       | 6.60                      | 7.65                       | 8.70                      |
| 17          | 4 70                      | 5.85                       | 7.00                      | 8.15                       | 9.25                      |
| 18          | 4 95                      | 6.20                       | 7.40                      | 8.60                       | 9.80                      |
| 20          | 5 50                      | 6.90                       | 8.25                      | 9.60                       | 10.95                     |
| 21          | -----                     | 7.25                       | 8.65                      | 10.10                      | 11.50                     |
| 22          | -----                     | 7.60                       | 9.10                      | 10.60                      | 12.10                     |
| 24          | -----                     | -----                      | 9.95                      | 11.60                      | 13.15                     |
| 26          | -----                     | -----                      | 11.30                     | 13.15                      | 14.95                     |
| 28          | -----                     | -----                      | 12.15                     | 14.15                      | 16.15                     |
| 30          | -----                     | -----                      | -----                     | 15.20                      | 17.65                     |

This pipe will be shipped in random lengths, plain ends, unless otherwise ordered.

For cut lengths an extra charge above random will be made.

For threaded pipe an extra charge above plain end will be made.

We can thread up to 22 inches. We can thread and couple up to 20 inches.

DRIVE PIPE

| DIAMETER, INCHES |                 | Nominal weight per foot, lbs. | Thickness, inches | Number threads per inch | Outside diameter of couplings, inches | Per foot                          |
|------------------|-----------------|-------------------------------|-------------------|-------------------------|---------------------------------------|-----------------------------------|
| Nominal, inside  | Actual, outside |                               |                   |                         |                                       |                                   |
| 3                | 3½              | 7.54                          | .217              | 8                       | 4 1⁄8                                 | Prices subject to market changes. |
| 4                | 4½              | 10.66                         | .237              | 8                       | 5 1⁄8                                 |                                   |
| 6                | 6⅝              | 18.76                         | .280              | 8                       | 7½                                    |                                   |
| 8                | 8⅝              | 28.18                         | .322              | 8                       | 9 1⁄8                                 |                                   |
| - - -            | - - -           | 32                            | - - -             | 8                       | - - -                                 |                                   |
| 10               | 10¾             | 40.06                         | .366              | 8                       | 11 7⁄8                                |                                   |
| 12               | 12¾             | 49                            | .375              | 8                       | 13 5⁄8                                |                                   |
| 14               | - - -           | 58                            | .375              | 8                       | 16 1⁄8                                |                                   |

LINE PIPE

| DIAMETER, INCHES |                 | Nominal weight per foot, lbs. | Thickness, inches | Number threads per inch | Outside diameter of couplings, inches | Per foot                          |
|------------------|-----------------|-------------------------------|-------------------|-------------------------|---------------------------------------|-----------------------------------|
| Nominal, inside  | Actual, outside |                               |                   |                         |                                       |                                   |
| 2                | 2.375           | 3.61                          | .154              | 11½                     | 2 3⁄4                                 | Prices subject to market changes. |
| 2½               | 2.875           | 5.74                          | .204              | 11½<br>8                | 3 1⁄2                                 |                                   |
| 3                | 3.5             | 7.54                          | .217              | 11½<br>8                | 4 1⁄8                                 |                                   |
| 3½               | 4               | 9                             | .226              | 11½<br>8                | 4 3⁄8                                 |                                   |
| 4                | 4.5             | 10.66                         | .237              | 10<br>8                 | 5 1⁄8                                 |                                   |
| 4½               | 5               | 12.49                         | .246              | 8                       | 5 3⁄8                                 |                                   |
| 5                | 5.563           | 14.50                         | .259              | 8                       | 6 3⁄8                                 |                                   |
| 6                | 6.625           | 18.76                         | .280              | 8                       | 7½                                    |                                   |
| 7                | 7.625           | 23.27                         | .301              | 8                       | 8 1⁄8                                 |                                   |
| 8                | 8.625           | 28.18                         | .322              | 8                       | 9 1⁄8                                 |                                   |
| 8                | 8.625           | 25                            | .281              | 8                       | 9 9⁄16                                |                                   |
| 10               | 10.75           | 40.06                         | .366              | 8                       | 11 7⁄8                                |                                   |
| 10               | 10.75           | 35                            | .3145             | 8                       | 11 7⁄8                                |                                   |
| 12               | 12.75           | 49                            | .375              | 8                       | 13 5⁄8                                |                                   |

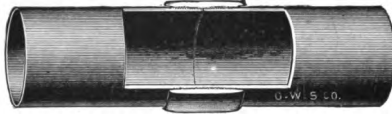
TUBING

| DIAMETER, INCHES |                 | Nominal weight per foot, lbs. | Thickness, inches | Number threads per inch | Outside diameter of couplings, inches | Per foot                          |
|------------------|-----------------|-------------------------------|-------------------|-------------------------|---------------------------------------|-----------------------------------|
| Nominal, inside  | Actual, outside |                               |                   |                         |                                       |                                   |
| 1                | 1.315           | 1.67                          | .134              | 11½                     | 1 5⁄8                                 | Prices subject to market changes. |
| 1½               | 1.66            | 2.24                          | .140              | 11½                     | 2 1⁄8                                 |                                   |
| 1½               | 1.9             | 2.68                          | .145              | 11½                     | 2 3⁄8                                 |                                   |
| 2                | 2.375           | 4.5                           | .1935             | 11½                     | 2 7⁄8                                 |                                   |
| 2                | 2.375           | 4                             | .1725             | 11½                     | 2 7⁄8                                 |                                   |
| 2½               | 2.875           | 5.74                          | .204              | 11½                     | 3 1⁄8                                 |                                   |
| 3                | 3.5             | 7.54                          | .217              | 11½                     | 4 1⁄8                                 |                                   |
| 3½               | 4               | 9                             | .226              | 11½                     | 4 3⁄8                                 |                                   |
| 4                | 4.5             | 10.66                         | .237              | 10                      | 5 1⁄8                                 |                                   |
| 6                | 6.625           | 18.76                         | .280              | 8                       | 7½                                    |                                   |

Flush joint drive pipe, line pipe, or tubing of any of the sizes mentioned, to order.



Fig. 1505



## LAP-WELDED CASING

WITH COUPLING JOINT

| DIAMETER, INCHES |          |          | Nominal weight per foot | Thickness, inches | No. of Threads per inch | Outside diameter of couplings, inches | Price per foot |
|------------------|----------|----------|-------------------------|-------------------|-------------------------|---------------------------------------|----------------|
| Nominal          | Internal | External |                         |                   |                         |                                       |                |
| 2                | 2.06     | 2½       | 2.22                    | .095              | 14                      | 2½                                    | \$0 23         |
| 2½               | 2.282    | 2½       | 2.82                    | .109              | 14                      | 3                                     | 29             |
| 2½               | 2.532    | 2½       | 3.13                    | .109              | 14                      | 3½                                    | 32             |
| 2½               | 2.782    | 3        | 3.45                    | .109              | 14                      | 3½                                    | 35             |
| 3                | 3.01     | 3½       | 4.10                    | .120              | 14                      | 3½                                    | 41             |
| 3½               | 3.26     | 3½       | 4.45                    | .120              | 14                      | 4                                     | 45             |
| 3½               | 3.51     | 3½       | 4.78                    | .120              | 14                      | 4½                                    | 48             |
| 3½               | 3.732    | 4        | 5.56                    | .134              | 14                      | 4½                                    | 56             |
| 4                | 3.982    | 4½       | 6.00                    | .134              | 14                      | 4½                                    | 60             |
| 4½               | 4.218    | 4½       | 6.36                    | .141              | 14                      | 5                                     | 64             |
| 4½               | 4.094    | 4½       | 9.38                    | .203              | 14                      | 5                                     | 1 00           |
| 4½               | 4.468    | 4½       | 6.73                    | .141              | 14                      | 5½                                    | 68             |
| 4½               | 4.344    | 4½       | 9.39                    | .203              | 14                      | 5½                                    | 1 00           |
| 4½               | 4.704    | 5        | 7.80                    | .148              | 14                      | 5½                                    | 78             |
| 5                | 4.954    | 5½       | 8.20                    | .148              | 14                      | 5½                                    | 82             |
| 5                | 4.867    | 5½       | 9.86                    | .191              | 14                      | 5½                                    | 1 00           |
| 5                | 4.753    | 5½       | 12.80                   | .248              | 11½                     | 5½                                    | 1 30           |
| 5                | 4.65     | 5½       | 15.88                   | .300              | 11½                     | 5½                                    | 1 50           |
| 5½               | 5.187    | 5½       | 8.62                    | .156              | 14                      | 6½                                    | 87             |
| 5½               | 5.042    | 5½       | 12.49                   | .229              | 11½                     | 6½                                    | 1 30           |
| 5½               | 5.688    | 6        | 10.46                   | .156              | 14                      | 6½                                    | 1 05           |
| 5½               | 5.594    | 6        | 12.04                   | .203              | 11½                     | 6½                                    | 1 20           |
| 5½               | 5.560    | 6        | 14.20                   | .220              | 11½                     | 6½                                    | 1 40           |
| 5½               | 5.457    | 6        | 16.70                   | .271              | 11½                     | 6½                                    | 1 60           |
| 6½               | 6.280    | 6½       | 11.58                   | .172              | 14                      | 7½                                    | 1 16           |
| 6½               | 6.219    | 6½       | 13.32                   | .203              | 14-11½                  | 7½                                    | 1 35           |
| 6½               | 6.149    | 6½       | 17.02                   | .238              | 11½                     | 7½                                    | 1 70           |
| 6½               | 6.640    | 7        | 12.34                   | .180              | 14                      | 7½                                    | 1 24           |
| 6½               | 6.503    | 7        | 17.51                   | .248              | 11½-10                  | 7½                                    | 1 75           |
| 7½               | 7.265    | 7½       | 13.55                   | .180              | 14                      | 8½                                    | 1 36           |
| 7½               | 7.617    | 8        | 15.41                   | .191              | 11½                     | 8½                                    | 1 55           |
| 7½               | 7.482    | 8        | 20.17                   | .259              | 11½                     | 8½                                    | 2 10           |
| 8½               | 8.265    | 8½       | 16.07                   | .180              | 11½                     | 9½                                    | 1 61           |
| 8½               | 8.167    | 8½       | 20.10                   | .229              | 11½                     | 9½                                    | 2 00           |
| 8½               | 8.082    | 8½       | 24.38                   | .271              | 11½-8                   | 9½                                    | 2 40           |
| 8½               | 8.640    | 9        | 17.60                   | .180              | 11½                     | 9½                                    | 1 76           |
| 9½               | 9.577    | 10       | 21.90                   | .211              | 11½                     | 10½                                   | 2 20           |
| 10½              | 10.594   | 11       | 26.72                   | .203              | 11½                     | 11½                                   | 2 68           |
| 11½              | 11.594   | 12       | 30.35                   | .203              | 11½                     | 12½                                   | 3 05           |
| 12½              | 12.457   | 13       | 33.78                   | .271              | 11½                     | 14                                    | 3 38           |
| 13½              | 13.432   | 14       | 42.02                   | .284              | 11½                     | 15                                    | ----           |
| 14½              | 14.416   | 15       | 47.66                   | .292              | 11½                     | 16½                                   | ----           |
| 15½              | 15.416   | 16       | 51.47                   | .292              | 11½                     | 17½                                   | ----           |

The Sleeve Coupling is used on casing, line pipe and tubing. The threads on the tube and in the coupling are cut to the same taper. The sleeve protects the threads of the couplings and guides the end of the tube. The last thread on the tube is nearly as deep as the first, and the tube is weakest and most liable to break at the last thread.

## GALVANIZED CASING

Per pound extra, net - - - - - \$----

## LINE PIPE, TUBING, AND CASING

### SLEEVE COUPLING FOR TUBING OR LINE PIPE

Fig. 1510



Taper threads

The sleeve coupling is used on casing, line pipe, and tubing. The threads on the tube and in the coupling are cut on a taper. The sleeve protects the threads of the couplings and guides the end of the tube.

Tubing furnished with the joint patented February 21, 1899, overcomes a difficulty that has never before been accomplished, viz., a joint that prevents vibration in the threads, removing all liability of breaking at the threads, and dropping.

The couplings are 5 inches long, with a sleeve at each end 1 inch long, turned to an exact gauge.

The outside of the tubing on which this coupling is to be placed is  $\frac{1}{8}$  inch larger than the regular size.

Above the threads the tubing is turned off 1 inch in width, to an exact gauge, the result being that when the tubing is screwed into the coupling the threads fit into each other the entire length, and the turned parts, fitting closely (metal to metal), make an absolutely tight and perfect joint.

No vibration can reach the threads. They are only required to sustain the weight.

If the tubing has to be cut and rethreaded, the metal beyond the threads, for 1 inch in width, must be filed off to fit the sleeve in the coupling. This can be done in a few moments.

Unless filed off beyond the threads, it will be impossible for the threads to enter far enough into the coupling to make a proper joint.

Threads, both on the tubing and in the coupling, are made to a taper of  $\frac{1}{8}$  inch to the foot, consequently they fit closely into each other the entire length.

The threads in the coupling and on the tubing are standard. Any fitting can be used with either.

The tubing is made of the best material, weighs  $4\frac{1}{2}$  lbs. to the foot, is hammer tested under 2,500 lbs. pressure, and carefully inspected.

### PATENT TUBING JOINT

Fig. 1511

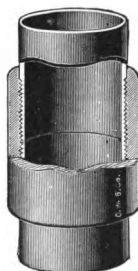


(Patented Feb. 21, 1899.)

Taper threads

### DRIVE PIPE, COUP- FLUSH JOINT PIPE LING JOINT

Fig. 1500



Straight threads

Fig. 1501



Can be driven if light  
blows are carefully  
given

### DRIVE PIPE AND FLUSH JOINT PIPE

Threads on drive pipe are straight, and the ends meet or "butt" in the center of the coupling. This pipe will stand heavy driving.

Flush joint drive pipe, tubing, or pipe is made by cutting away portions of the tubes and putting threads thereon. The pipe has the same inside and outside diameters at the joint as at other places, so that it is perfectly flush both inside and out.

A larger size of flush joint pipe can be used in wells than of pipe with couplings, but it is not so strong.

Flush joint pipe can be driven if care is used, but for driving purposes it is better to make it of extra strong pipe.

### INSERTED JOINT FLUSH JOINT

Fig. 1506



Fig. 1507



### INSERTED AND FLUSH JOINT CASING

Inserted joint casing and flush joint casing are sometimes used in oil and gas wells instead of flush joint pipe, being lighter and having more inside space for the tools. It should not be driven.

The "inserted joint casing" is made by cutting a thread on one end and expanding the other and cutting in it an interior thread, so that the end of one piece screws into the end of another.

"Flush joint casing" is made by cutting interior and exterior taper threads on respective ends of the pipe, so that the end of one piece will screw into the other. This joint is not strong, and the casing must be used with great care.

## PIPE TRADE CUSTOMS

Every piece of pipe, tubing, casing, line pipe, drive pipe and boiler tube, is carefully examined and tested, but as it is impossible to always detect imperfections, the only guarantee that is ever given is to replace such goods as prove defective. Under no circumstances is the seller responsible for any damages beyond the price of the goods. No charges for labor or expenses required to repair defective goods or occasioned by them will be allowed. If goods are defective, the measure of damages is the price of the defective pieces.

To equalize the prices in different places, goods are sometimes sold "freight allowed to destination" or with a mentioned freight allowance, but this freight allowance is only a discount on the price and is not a contract for delivery; the shipper's responsibility ends when goods are delivered to the transportation company.

For goods lost or damaged in transit, buyers must look to the carrier only.

Shipments by land, river or lake, will be insured only when buyers so instruct.

Ocean shipments are insured for the benefit of consignee and the premium is charged. If buyers do not desire such insurance they should so advise with the order.

Claims for shortage or deductions for erroneous charges must be promptly presented or will not be allowed. Special goods made to specification, where buyer is to inspect, must be inspected and accepted before shipment is made. After shipment is made our responsibility ceases.

Requests for cancellation of orders, calling for odd sizes or cut lengths, will not be considered, if the manufacture of the material has been commenced when the request reaches the mill.

Ordinary merchant pipe is sold in random lengths with threads on both ends and with a coupling on one end of each piece.

X strong, XX strong and hydraulic pipe are sold without threads or couplings, unless threads and couplings are specified, and then an additional charge is made for such threads and couplings.

An extra charge is always made for pipe cut to special lengths.

Pipe "cut to order" is threaded at each end; but no couplings are furnished. If couplings are desired they must be ordered and an extra charge will be made for them.

When pipe is ordered cut to a particular length "with coupling," a coupling is screwed on one end and is measured in the length.

There is no such thing known in the trade as "Double Thick Pipe." When pipe heavier than standard is required, either X strong, XX strong or hydraulic should be ordered, and the thickness of hydraulic pipe must be specified.

Standard weight Casing (the lightest weight) is always furnished on orders unless another weight is specified.

The outside diameter of goods heavier than "Standard" is the same as "Standard," the extra thickness being on the inside, so that the different weights of the same size use the same couplings.

Sheet iron thread protectors are not charged.

Wrought iron thread protectors on line pipe are charged, but if returned, credit will be given at prices charged.

Boiler tubes are sold cut to length without extra charge for cutting.

Boiler tubes are rated by their outside diameter; all other pipe by the nominal inside diameter, but goods heavier than "Standards" are less in actual diameter than in nominal diameter.

Quotations are for immediate acceptance.

Prices are subject to change without notice.

All pipe orders are accepted by manufacturers subject to strikes, accidents and other unavoidable delays.

The time of delivery is never of the essence of a pipe contract.

When shipments are made consigned to our own order, such shipments are for the accommodation of the buyer and are subject to the same rules as if made to the buyer. That is to say, all damages and all losses in transportation must be borne by the buyer. The shipper's claim against the transportation company, if any, will be assigned to the buyer without recourse.

## MANILA ROPE FOR WELLS

Fig. 1528

Drilling cable,  
hawser laid

Drilling cable sizes, 2½, 2¼, 2⅓, 2, 1⅞, 1¾, and 1⅝ inches, fig. 1528.

Sand pump lines, sizes 1½, 1, ¾, ⅔, ⅝, and ½ inches, fig. 1528.

Tubing lines, sizes, 2½, 2¼, 2⅓, 2, 1⅞ and 1¾ inches, fig. 1528.

Sucker rod lines, sizes, 1¾, 1⅝, 1½, and 1¼ inches, fig. 1528.

Bull ropes, sizes, 3, 2½, 2¼, 2⅓, and 2 inches, fig. 1527.

## PLAIN LAID

½ inch and larger.....Base Price

¾ inch Rope, advance per pound.....\$0 00½

1 and ⅝ inch rope, advance per pound..... 01

1⅞ inch rope, advance per pound..... 01½

Add one cent per pound when cut to order.

## BOLT CABLES

Cables made from selected Manila fiber, other-  
wise known as Bolt Ropes, advance over regular  
cables, per pound ..... \$0 02

Fig. 1527

Bull rope,  
plain laid

## DIAMETERS AND APPROXIMATE WEIGHTS

## HAWSER LAID ROPES

| Size - - - - - inches           | ½   | ⅝   | ¾   | 7/8 | 1    | 1⅛  | 1¼  | 1½   | 1⅝ | 1¾    | 1⅞    | 2     | 2⅓    | 2½    | 2⅞    |
|---------------------------------|-----|-----|-----|-----|------|-----|-----|------|----|-------|-------|-------|-------|-------|-------|
| Drilling cables, weight - lbs.  | 1/8 | 1/6 | 1/4 | 1/3 | 5/16 | 1/2 | 3/8 | 7/16 | 1  | 1 1/8 | 1 1/4 | 1 1/2 | 1 3/4 | 1 7/8 | 2 1/8 |
| Sucker rod lines, weight - lbs. | 1/8 | 1/6 | 1/4 | 1/3 | 5/16 | 1/2 | 3/8 | 7/16 | 1  | 1 1/8 | 1 1/4 | 1 1/2 | 1 3/4 | 1 7/8 | 2 1/8 |
| Sand pump lines, weight - lbs.  | 1/8 | 1/6 | 1/4 | 1/3 | 5/16 | 1/2 | 3/8 | 7/16 | 1  | 1 1/8 | 1 1/4 | 1 1/2 | 1 3/4 | 1 7/8 | 2 1/8 |

## PLAIN LAID

| Size - - - - - inches | ½   | ⅝   | ¾   | 7/8 | 1   | 1⅛    | 1¼    | 1½    | 1⅝    | 1¾    | 1⅞ | 2     | 2⅓    | 2½    | 2⅞ |
|-----------------------|-----|-----|-----|-----|-----|-------|-------|-------|-------|-------|----|-------|-------|-------|----|
| Weight - - - - - lbs. | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1 1/8 | 1 1/4 | 1 1/2 | 1 3/4 | 1 7/8 | 2  | 2 1/4 | 2 1/2 | 2 3/4 | 3  |

## DIAMETER AND APPROXIMATE WEIGHTS OF BULL ROPE, Fig. 1527

| Size - - - - - inches                       | 2     | 2⅓    | 2½    | 2⅞    | 3     |
|---------------------------------------------|-------|-------|-------|-------|-------|
| Approximate weight, per foot - - - - - lbs. | 1 1/2 | 1 1/4 | 1 1/8 | 1 1/4 | 1 1/2 |

All manila cordage is sold by weight. Price per pound subject to market quotations.

STEEL WIRE ROPES—see page 132.

Fig. 2258

## BULL ROPE COUPLINGS

Fig. 2260



Common, 2½ and 2¼ inch, fig. 2258. Weight, 6 lbs. - - - - - each, \$0 80  
 Common, 2½ and 2¼ inch, fig. 2258. Weight, 7 lbs. - - - - - each, 1 10  
 Common, 3 inch, extra heavy, fig. 2258. Weight, 10 lbs. - - - - - each, 2 50  
 Rogers' patent, fig. 2260 - - - - - each, 1 75

WIRE ROPE FOR WELLS

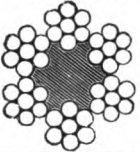
Fig. 1526



SAND LINE

Made from special cast steel wire of a high tensile strength, combined with toughness and extra wearing qualities. Each wire is carefully tested to insure uniformity and durability. Sand lines, all sizes; are composed of 6 strands of 7 wires each, or 42 wires in all, laid around a hemp center.

Fig. 1526-A



| Size - - - - - inches                                  | $\frac{3}{8}$        | $\frac{7}{16}$   | $\frac{1}{2}$    | $\frac{9}{16}$ | $\frac{5}{8}$  |
|--------------------------------------------------------|----------------------|------------------|------------------|----------------|----------------|
| Weight, per foot - - - - - lbs.                        | .22                  | .30              | .39              | .50            | .62            |
| Breaking strain in tons of 2,000 pounds - - - - -      | 4.8                  | 6.6              | 8.4              | 10             | 13             |
| Proper working loads in tons of 2,000 pounds - - - - - | 1                    | $1\frac{1}{3}$   | $1\frac{1}{4}$   | $2\frac{1}{4}$ | $2\frac{1}{2}$ |
| Per foot - - - - -                                     | \$0 05 $\frac{1}{2}$ | 06 $\frac{1}{2}$ | 07 $\frac{1}{2}$ | 09             | 11             |

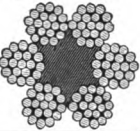
Fig. 1533



TUBING AND CASING LINES

Are composed of 6 strands of 19 wires each, or 114 wires in all, laid around a hemp center. These are more pliable than the ropes used for sand line purposes.

Fig. 1533-A



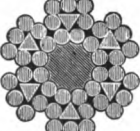
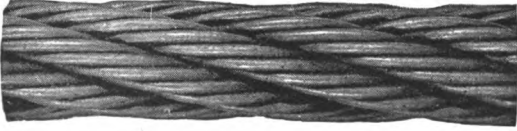
| Size - - - - - inches                                  | $\frac{5}{8}$  | $\frac{3}{4}$  | $\frac{7}{8}$  | 1              | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
|--------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Breaking strain in tons of 2,000 pounds - - - - -      | 13.6           | 19.4           | 26.            | 34.            | 42.            | 50.            |
| Proper working loads in tons of 2,000 pounds - - - - - | $2\frac{3}{4}$ | $3\frac{3}{4}$ | $5\frac{1}{4}$ | $6\frac{3}{4}$ | $8\frac{1}{2}$ | 10             |
| Approximate weight, per foot - - - - - lbs.            | .62            | .89            | 1.20           | 1.58           | 2.00           | 2.50           |
| Per foot - - - - -                                     | \$0 14         | 18             | 23             | 30             | 38             | 46             |

WIRE SUCKER ROD LINE, LEFT TWIST

| Size - - - - - inches                                                                           | $\frac{3}{8}$        | $\frac{1}{2}$    |
|-------------------------------------------------------------------------------------------------|----------------------|------------------|
| Made of 6 strands of 19 wires each, crucible cast steel, per foot - - - - -                     | \$0 09 $\frac{1}{2}$ | 11               |
| Made of 6 strands of 25 wires each, crucible steel, patent flattened strand, per foot - - - - - | - - -                | 14 $\frac{1}{2}$ |

LESCHEN'S PATENT FLATTENED STRAND DRILLING ROPE

Fig. 1534

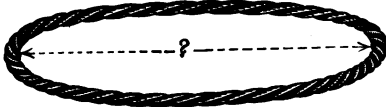


| Size - - - - - inches                                        | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{3}{4}$    | $\frac{7}{8}$    | 1    | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
|--------------------------------------------------------------|---------------|---------------|---------------|------------------|------------------|------|----------------|----------------|
| Approximate weight, per foot, lbs.                           | .25           | .40           | .68           | .93              | 1.20             | 1.64 | 2.00           | 2.40           |
| Per foot - - - - -                                           | \$0 07        | 10            | 14            | 20 $\frac{1}{2}$ | 27 $\frac{1}{2}$ | 35   | 45             | 54             |
| Hawser laid drilling cables for cleaning out wells - - - - - | - - -         | - - -         | - - -         | 19 $\frac{1}{2}$ | 26 $\frac{1}{2}$ | 34   | - - -          | - - -          |

## STEEL WIRE DEAD LINES

The wire dead line is used to attach snatch block to crown block, thus distributing strain over top of derrick.

Fig. 1546 A



Endless

In ordering make sketch as above giving length when doubled.

Fig. 1547



Single

In ordering specify length over all; also size of loop at each end.

|                                          | Endless, Fig. 1546A |        |                |                |                | Single, Fig. 1547 |        |                |                |                |
|------------------------------------------|---------------------|--------|----------------|----------------|----------------|-------------------|--------|----------------|----------------|----------------|
| Diameter, inches                         | $\frac{7}{8}$       | 1      | $1\frac{1}{8}$ | $1\frac{1}{4}$ | $1\frac{1}{2}$ | $\frac{7}{8}$     | 1      | $1\frac{1}{8}$ | $1\frac{1}{4}$ | $1\frac{1}{2}$ |
| Weight per 100 ft. lbs.                  | 120                 | 158    | 200            | 245            | 355            | 120               | 158    | 200            | 245            | 355            |
| Extra length required for splicing, feet | 10                  | 10     | 12             | 12             | 12             | 10                | 10     | 12             | 12             | 12             |
| Per foot                                 | \$0 23              | \$0 30 | \$0 38         | \$0 46         | \$0 66         | \$0 23            | \$0 30 | \$0 38         | \$0 46         | \$0 66         |
| Extra for splicing                       | 4 00                | 4 00   | 4 00           | 4 50           | 4 50           | 4 00              | 4 00   | 4 00           | 4 50           | 4 50           |

## GALVANIZED THIMBLE FOR WIRE ROPE

Fig. 1535



| Diameter of rope | Price  | Diameter of rope | Price | Diameter of rope | Price |
|------------------|--------|------------------|-------|------------------|-------|
| $\frac{1}{4}$    | \$0 08 | $\frac{5}{8}$    | 13    | $1\frac{1}{8}$   | 28    |
| $\frac{5}{16}$   | 08     | $\frac{3}{4}$    | 15    | $1\frac{1}{4}$   | 33    |
| $\frac{3}{8}$    | 09     | $\frac{7}{8}$    | 16    | $1\frac{3}{8}$   | 42    |
| $\frac{1}{2}$    | 10     | 1                | 20    | $1\frac{1}{2}$   | 50    |
| $\frac{1}{2}$    | 11     |                  |       |                  |       |

## WIRE ROPE SOCKETS

Fig. 1536



Closed

Fig. 1537



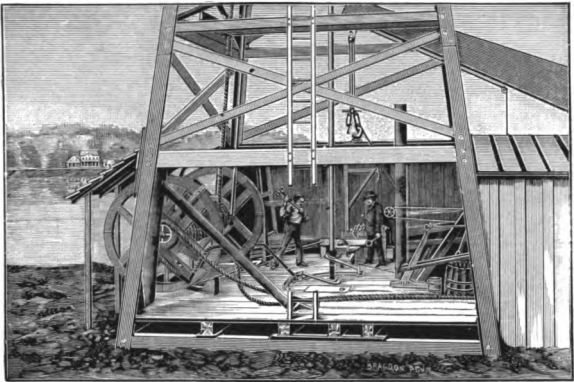
Open

| Diameter - - - inches | $\frac{5}{16}$ | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1    | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
|-----------------------|----------------|---------------|----------------|---------------|----------------|---------------|---------------|---------------|------|----------------|----------------|
| Closed, loose         | \$0 70         | 85            | 85             | 1 10          | 1 10           | 1 35          | 1 65          | 1 85          | 2 40 | 3 30           | 4 50           |
| Closed, fastened      | 1 60           | 1 85          | 2 00           | 2 25          | 2 35           | 2 65          | 3 15          | 3 85          | 4 65 | 6 15           | 8 00           |
| Open, loose           | 85             | 1 00          | 1 00           | 1 35          | 1 35           | 1 65          | 2 10          | 2 50          | 3 15 | 4 50           | 6 10           |
| Open, fastened        | 1 75           | 2 00          | 2 15           | 2 50          | 2 60           | 2 95          | 3 60          | 4 50          | 5 40 | 7 35           | 9 60           |

For special tools, used in connection with wire ropes for drilling, see pages 138, 140, 141, 152.

WELL DRILLING TOOLS

Fig. 1265



Interior view of derrick, showing workmen dressing tools, location of forge, bellows, anvil, etc.

A DRILLING OR BORING PLANT FOR THE STANDARD CABLE SYSTEM

In use throughout the American oil fields involves certain factors which may vary to suit local requirements, but under any condition must comprise :

|                                |           |                      |
|--------------------------------|-----------|----------------------|
| A derrick or rig               | - - - - - | see pages 6 to 50    |
| Boiler and engine              | - - - - - | see pages 71 to 102  |
| Drilling tools and accessories | - - - - - | see pages 134 to 185 |
| Drilling cable and sand line   | - - - - - | see pages 131 & 132  |
| Blacksmiths' tools             | - - - - - | see pages 277 & 279  |

WOOD CONDUCTOR

Fig. 2285



|                          |        |    |    |    |    |
|--------------------------|--------|----|----|----|----|
| Size - - - - - inches    | 8      | 10 | 12 | 13 | 14 |
| Per foot - - - - -       | \$0 25 | 40 | 50 | 55 | 60 |
| K. D. - - - - - per foot | 20     | 30 | 40 | 45 | 50 |

## THE FOLLOWING LIST IS AN EXAMPLE OF A SIMPLE STANDARD OUTFIT

(RIG NOT INCLUDED)

| ARTICLES                                                                                          | Weight,<br>lbs. | ARTICLES                                              | Weight,<br>lbs. |
|---------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------|-----------------|
| 1 boiler, 20 H.P. - - - - -                                                                       | 5,800           | 1 set tool wrenches - - - - -                         | 450             |
| 1 engine, 20 H.P. - - - - -                                                                       | 4,000           | 1 Barrett jack, No. 1 - - - - -                       | 209             |
| 1 belt, 10 in., 5-ply, 90 ft. - - - -                                                             | 140             | 1 40 in. bellows - - - - -                            | 150             |
| 1 drilling cable, 2 in. x 1,500 ft. - -                                                           | 2,143           | 1 150-lb. anvil - - - - -                             | 150             |
| 1 wire sand line, $1\frac{7}{8}$ in. x 1,500 ft. - -                                              | 470             | 2 14-lb. sledges, with handles - - -                  | 32              |
| 1 bull rope, 2 in. x 85 ft. - - - -                                                               | 115             | 1 ball peen hammer, No. 71 - - - -                    | 2               |
| 1 telegraph cord - - - - -                                                                        | 3               | 1 pair blacksmith tongs - - - - -                     | 5               |
| 1 temper screw, $1\frac{1}{2}$ in. with $1\frac{1}{2}$ in.<br>lower parts - - - - -               | 270             | 1 tubing or casing line, 2 in. x 240 ft. -            | 340             |
| 1 New Era rope socket, $2\frac{1}{2}$ in. x $3\frac{1}{2}$ in.-7                                  | 125             | 1 set Fairs mall. elevators, $5\frac{1}{2}$ in. - -   | 70              |
| 1 set jars, $5\frac{1}{2}$ in. diam., $2\frac{1}{2}$ in. x $3\frac{1}{2}$ in.-7                   | 300             | 1 single snatch block, 20 in. - - - -                 | 54              |
| 1 auger stem, $3\frac{1}{2}$ in. x 36 ft., $2\frac{1}{2}$ in. x<br>$3\frac{1}{2}$ in.-7 - - - - - | 1,400           | 1 single snatch block hook - - - - -                  | 50              |
| 1 spudding bit, 13 in.-80 lb. steel - -                                                           | 300             | 1 Chickering sand pump, 4 in., for $5\frac{1}{2}$ in. | 80              |
| 2 sets drilling bits, 8 in., 6 in. - - -                                                          | 1,100           | 1 Morahan sand pump, $5\frac{1}{2}$ in., for 8 in.    | 140             |
| 2 tool gauges, 8 in., 6 in. - - - -                                                               | 17              | 1 wrought iron bailer, 5 in. - - - -                  | 175             |
|                                                                                                   |                 | 1 horn socket - - - - -                               | 125             |

Total estimated weight, 18,215 pounds.

The estimated value of the foregoing is \$1,625.00, loaded on cars at Pittsburgh. The outfit is adapted to ordinary rock formations, and is capable of drilling twelve to fourteen hundred feet or deeper by the substitution of longer cable and sand line.

It should be observed, however, that the list contains only the absolute necessities, and no provision is made for difficult formations, or for "fishing jobs."

When our correspondents desire us to recommend suitable outfits, we will undertake to do so when furnished with following data:

First—Location. As we have supplied outfits to nearly all habitable parts of the globe, our records will frequently assist in a proper selection of outfit when exact location is known.

Second—What is the extreme depth required?

Third—Distance from surface to first rock.

Fourth—Are there underlying beds of sand or other very soft formations?

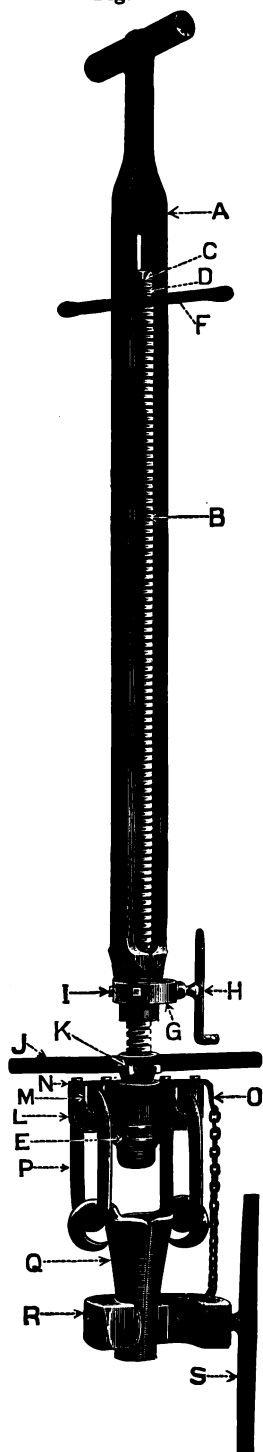
Fifth—Is there ample water supply for feeding boiler and for hydraulic rotary?

Sixth—Is timber available for building rig and derrick?

Seventh—Is fuel abundant? and of what character—coal, wood, gas or oil?



**HEAVY PATTERN**  
Fig. 1554

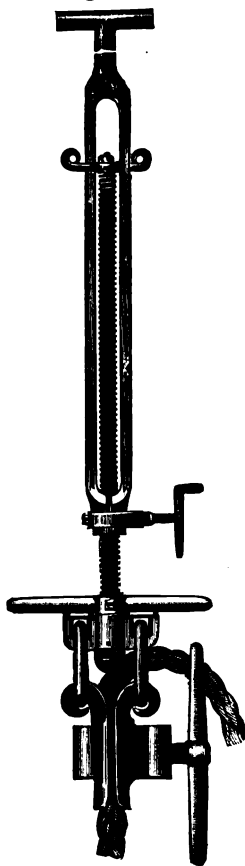


# WELL DRILLING TOOLS FOR CABLE SYSTEM

TEMPER SCREWS AND PARTS

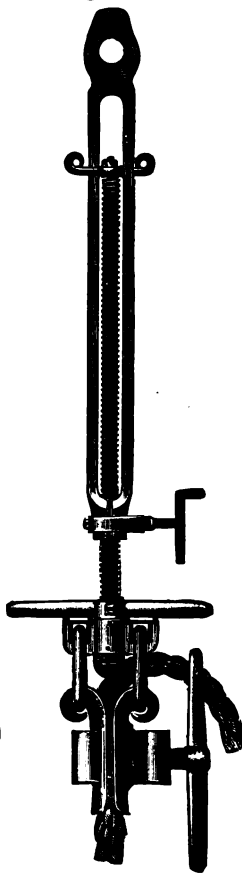
**REGULAR PATTERN**  
**WITH TEE**

Fig. 1553



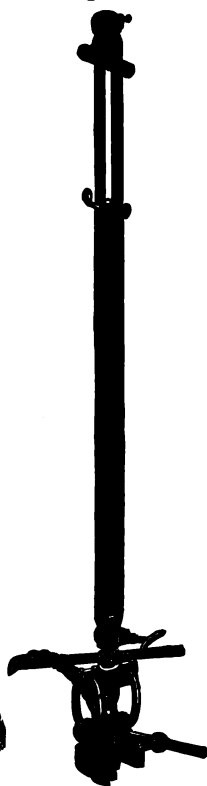
**WITH EYE**

Fig. 1550



**WITH BOX AT EACH END**

Fig. 1569



Patented

**CONE ROLLER BEARING**

Fig. 1573



**BALL BEARING**

Fig. 1563



## PRICES OF TEMPER SCREWS

WITH B. B. WASHERS, TOP AND BOTTOM, AND PARTS

| COMPLETE                               |                                             |  |  | REGULAR PATTERN<br>Figs. 1553-1550 |                |         |                |                                        |                | HEAVY PATTERN<br>Fig. 1554 |                |         |                |
|----------------------------------------|---------------------------------------------|--|--|------------------------------------|----------------|---------|----------------|----------------------------------------|----------------|----------------------------|----------------|---------|----------------|
| Size of screw - inches                 |                                             |  |  | 1½                                 |                | 1¾      |                | 2                                      |                | 1¾                         |                | 2       |                |
| T or eye<br>to let out,<br>feet inches | Total<br>length of<br>screw,<br>feet inches |  |  | Price                              | Weight<br>lbs. | Price   | Weight<br>lbs. | With<br>1½<br>lower<br>parts,<br>price | Weight<br>lbs. | Price                      | Weight<br>lbs. | Price   | Weight<br>lbs. |
| 4 0                                    | 5 4                                         |  |  | \$40 00                            | 224            | \$45 00 | 245            | \$42 50                                | 233            |                            |                |         |                |
| 4 7                                    | 6 0                                         |  |  | 41 00                              | 232            | 46 00   | 256            | 43 50                                  | 244            | \$52 50                    | 285            |         |                |
| 5 0                                    | 6 6                                         |  |  |                                    |                | 47 50   | 267            | 45 00                                  | 255            | 55 00                      | 296            |         |                |
| 5 6                                    | 7 0                                         |  |  |                                    |                | 50 00   |                |                                        |                | 57 50                      | 307            |         |                |
| 6 0                                    | 7 6                                         |  |  |                                    |                | 52 50   |                |                                        |                | 60 00                      | 318            |         |                |
| 4 4                                    | 6 0                                         |  |  |                                    |                |         |                |                                        |                |                            |                | \$60 00 | 317            |
| 4 10                                   | 6 6                                         |  |  |                                    |                |         |                |                                        |                |                            |                | 62 50   | 330            |
| 5 4                                    | 7 0                                         |  |  |                                    |                |         |                |                                        |                |                            |                | 65 00   | 343            |
| 5 10                                   | 7 6                                         |  |  |                                    |                |         |                |                                        |                |                            |                | 67 50   | 356            |
| For cone bearing washers add to list   |                                             |  |  |                                    |                | 50      |                | 50                                     |                | 50                         |                | 75      |                |

If fitted with interchangeable box (Fig. 1559, page 139), add to list \$9.00

| PARTS<br>(See Fig. 1554, page 136)                  |  |  |  |  |  | REGULAR<br>PATTERN |       | HEAVY<br>PATTERN |       |
|-----------------------------------------------------|--|--|--|--|--|--------------------|-------|------------------|-------|
| Size of screw for - - - - - inches                  |  |  |  |  |  | 1½                 | 1¾    | 1¾               | 2     |
| A—Frame with T, for screw 5 feet 4 inches - - - - - |  |  |  |  |  | \$12 00            | 12 50 | 13 50            | ----- |
| A—Frame with T, for screw 6 feet 0 inches - - - - - |  |  |  |  |  | 12 50              | 13 00 | 14 00            | 18 50 |
| A—Frame with T, for screw 6 feet 6 inches - - - - - |  |  |  |  |  | 13 00              | 13 50 | 14 50            | 20 00 |
| A—Frame with T, for screw 7 feet 0 inches - - - - - |  |  |  |  |  |                    |       | 15 00            | 21 50 |
| A—Frame with T, for screw 7 feet 6 inches - - - - - |  |  |  |  |  |                    |       | 15 75            | 22 50 |
| B—Main screw, 5 feet 4 inches long - - - - -        |  |  |  |  |  | 3 90               | 4 75  | 4 75             | ----- |
| B—Main screw, 6 feet 0 inches long - - - - -        |  |  |  |  |  | 4 00               | 4 90  | 4 90             | 5 75  |
| B—Main screw, 6 feet 6 inches long - - - - -        |  |  |  |  |  | 4 20               | 5 10  | 5 10             | 6 00  |
| B—Main screw, 7 feet 0 inches long - - - - -        |  |  |  |  |  |                    |       | 5 30             | 6 50  |
| B—Main screw, 7 feet 6 inches long - - - - -        |  |  |  |  |  |                    |       | 5 50             | 7 00  |
| C—Nut for main screw - - - - -                      |  |  |  |  |  | 10                 | 10    | 10               | 10    |
| D—Upper ball bearing, complete - - - - -            |  |  |  |  |  | 75                 | 75    | 75               | 75    |
| E—Lower ball bearing, complete - - - - -            |  |  |  |  |  | 1 50               | 1 50  | 1 50             | 2 50  |
| Balls, only - - - - -                               |  |  |  |  |  | 05                 | 05    | 05               | 05    |
| Cone bearing, complete - - - - -                    |  |  |  |  |  |                    | 2 50  | 2 50             | 4 00  |
| Cones, only - - - - -                               |  |  |  |  |  |                    | 10    | 10               | 10    |
| Washers, only (copper) - - - - -                    |  |  |  |  |  | 25                 | 30    | 30               | 40    |
| Washers, only (steel) - - - - -                     |  |  |  |  |  | 10                 | 15    | 15               | 20    |
| F—Elevator - - - - -                                |  |  |  |  |  | 1 25               | 1 25  | 1 25             | 1 50  |
| G—Yoke - - - - -                                    |  |  |  |  |  | 1 75               | 1 75  | 1 75             | 1 75  |
| H—T screw for yoke - - - - -                        |  |  |  |  |  | 1 25               | 1 25  | 1 25             | 1 25  |
| I—Yoke set screws, each - - - - -                   |  |  |  |  |  | 10                 | 10    | 10               | 10    |
| J—Cross bar - - - - -                               |  |  |  |  |  | 1 75               | 1 75  | 2 00             | 3 00  |
| K—Cross bar set screws, each - - - - -              |  |  |  |  |  | 10                 | 10    | 10               | 10    |
| L—Mack's patent swivel - - - - -                    |  |  |  |  |  | 4 50               | 4 50  | 5 50             | 5 50  |
| M—Mack's patent link seat - - - - -                 |  |  |  |  |  | 30                 | 30    | 40               | 40    |
| N—Link seat cap or plate - - - - -                  |  |  |  |  |  | 15                 | 15    | 15               | 15    |
| O—C chain connection, complete - - - - -            |  |  |  |  |  |                    | 2 50  | 2 50             | 2 50  |
| P—Clamp links, per pair - - - - -                   |  |  |  |  |  | 1 50               | 1 50  | 1 50             | 1 50  |
| Q—Rope clamps, per set - - - - -                    |  |  |  |  |  | 5 00               | 6 00  | 6 50             | 6 50  |
| R—C, only - - - - -                                 |  |  |  |  |  | 3 75               | 5 50  | 6 00             | 6 00  |
| S—C screw with handle, solid - - - - -              |  |  |  |  |  | 3 25               | 3 25  | 3 75             | 3 75  |

Frame with box at each end, for 6-foot screw - - - - - \$22 50

Frame with box at each end, for 6-foot 6-inch screw - - - - - 23 00

Frame with box at each end, for 7-foot screw - - - - - 24 00

Plugs - - - - - 4 50

Interchangeable boxes (Fig. 1559, page 139), each - - - - - 9 00

**WELL DRILLING TOOLS**

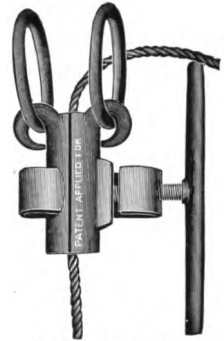
FOR CABLE SYSTEM

**TEMPER SCREW CLAMPS FOR DRILLING WITH WIRE ROPE****MACK'S PATENT****Fig. 1576****Weight 102 lbs.**

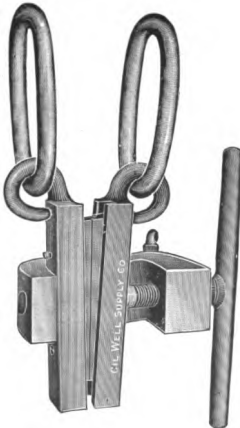
Price - - - - \$36 00

**RIGBY'S PATENT****Fig. 1576-A****Weight 125 lbs.**

Price - - - - \$50 00

**CALIFORNIA STYLE****Fig. 1576-C****Weight 115 lbs.**

Price - - - - \$25 00

**WOODSFIELD STYLE****Fig. 1576-D****Fig. 1576-D****Weight 115 lbs.**

Price - - - - \$65 00

**SEELEY****Fig. 1576-E****Fig. 1576-E****Weight 115 lbs.**

Price - - - - \$36 00

A full description of cables will be found on pages 131-132.

Drilling cables have been made of manila fiber almost exclusively until the past few years. This material is well adapted to the purpose, owing to its strength and elasticity.

Cables of steel wire are gradually finding favor, especially for "cleaning out" or increasing the depth of completed wells.

The steel cables require special temper screw clamps and rope sockets. We recommend the Mack's patent temper screw clamps and the O. W. S. patent rope socket.

Unless otherwise specified, attachments for manila cable are always furnished.

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

SPEARBECK TEMPER SCREW CLAMP  
FOR MANILA ROPE

Fig. 1570

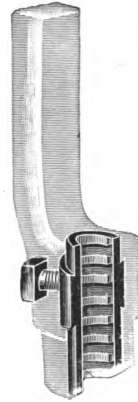


Weight 120 lbs.

Price - - - - - \$36 00

INTERCHANGEABLE TEMPER  
SCREW BOX

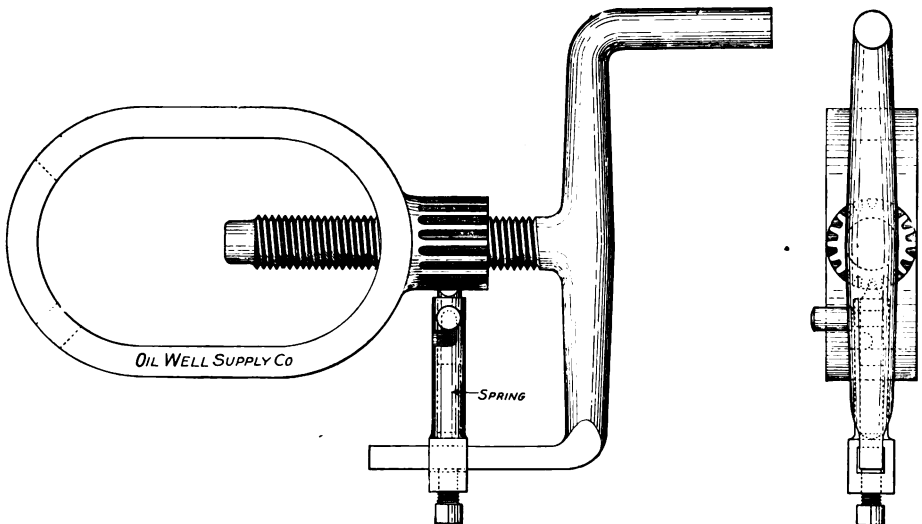
Fig. 1559



For list see page 137

## "HOLD FAST" TEE SCREW FOR TEMPER SCREW

Fig. 1560

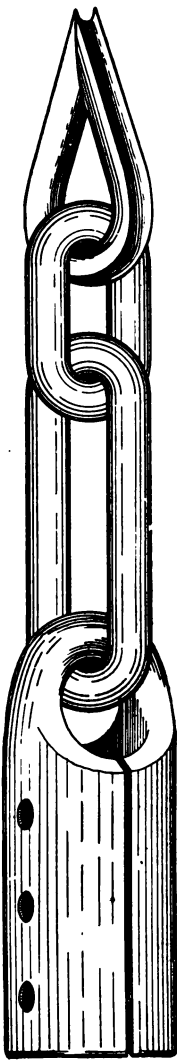


Patented Feb. 13, 1906.

SMITH'S WIRE ROPE CONNECTION

CONNECTION

Fig. 1598



Patented

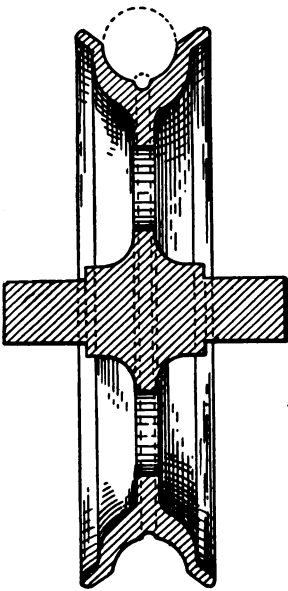
Wire Drilling Cable is rapidly coming into use and this connection seems to overcome the difficulties heretofore encountered on account of the lack of stretch or elasticity in the Wire Rope.

It is customary to use from 150 to 200 feet of Manila Line next to the tools, thus providing ample elasticity.

It is necessary to use a special Crown Pulley with this attachment. The Pulley is provided with a wide groove to carry the connection. This groove is narrowed towards the base to carry the Manila Line and has a shallow trough in the base to carry the Wire Line.

SPECIAL CROWN PULLEY

Fig. 2243



Patented.

|                                                     |         |
|-----------------------------------------------------|---------|
| Smith's Patent Wire Rope Connection - - - - - Each  | \$17 50 |
| Special Crown Pulley, (weight 430 lbs.) - - - - - " | 26 00   |

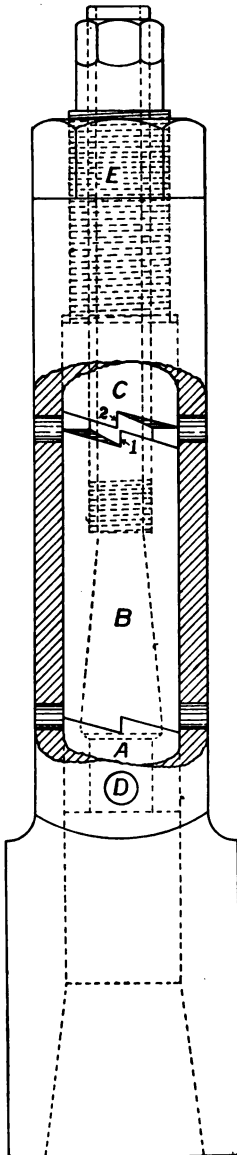
FISHING SOCKET

TO TAKE HOLD OF THE CONNECTION WHEN  
LOST IN WELL

|                       |                               |                               |                               |                               |
|-----------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Size - - - - - inches | 5 <sup>5</sup> / <sub>8</sub> | 6 <sup>1</sup> / <sub>4</sub> | 6 <sup>3</sup> / <sub>8</sub> | 8 <sup>1</sup> / <sub>4</sub> |
| Price - - - - -       | \$60 00                       | 65 00                         | 65 00                         | 87 00                         |

**THE ONLY RELIABLE  
ROTARY ROPE SOCKET**

Fig. 1577 C



For Use With  
Wire Drilling Cable

**THE O. W. S. CO. ROTARY SOCKET**

PATENTED JUNE 9, 1903

The illustration shows the Socket in sectional form. As the Drilling Cable receives the weight of the tools the upper clutch engages. The weight of the tools causes the cable to unlay or unwind, which changes their radial position while in elevation. As soon as the tools reach the position where the cable is relieved of their weight it springs back carrying the swivel block "B" with it one quarter turn or until lower clutch is engaged. The upper clutch is now ready to engage on receiving the weight of the tools. Thus on every stroke of the walking beam the tools are in a different position, being one quarter of a revolution in advance of the previous stroke.

**DIRECTIONS**

To connect Socket to cable remove lower block "A" by taking out pin "D." Withdraw swivel block "B," insert cable through hood and connect in swivel block "B" by turning ends of cable back and babbitting. Replace parts and be sure that adjustment is proper for swivel block "B" to unwind one quarter turn when weight of tools is relieved from cable. To make test, drop tools on wrench. If adjustment is needed screw top clutch block "C" to proper position as shown in cut; i. e., with face "1" slightly in advance of face "2" and points slightly apart. Secure thoroughly by jam nut "E."

Prices on application.

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## TOOL WRENCHES

Two in a set, right and left hand

Fig. 1620

Fig. 1617



Form of wrench, 200 lbs. and heavier

| Size of square, inches    | 2½      | 2¾    | 3¼    | 3½    | 3¾    | 4     | 4     | 4     | 4     |
|---------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| Weight, each - lbs.       | 100     | 135   | 135   | 150   | 150   | 175   | 175   | 200   | 225   |
| Per set - - - -           | \$25 50 | 28 75 | 28 75 | 31 50 | 31 50 | 36 50 | 36 50 | 39 50 | 43 50 |
| Size of square - - inches | 4½      | 4½    | 4½    | 4½    | 5     | 5     | 5     | 5     | 5½    |
| Weight, each - - - lbs.   | 225     | 250   | 275   | 300   | 275   | 300   | 350   | 400   | 450   |
| Per set - - - - -         | \$43 50 | 47 50 | 52 50 | 57 00 | 52 50 | 57 00 | 66 50 | 75 00 | 83 50 |

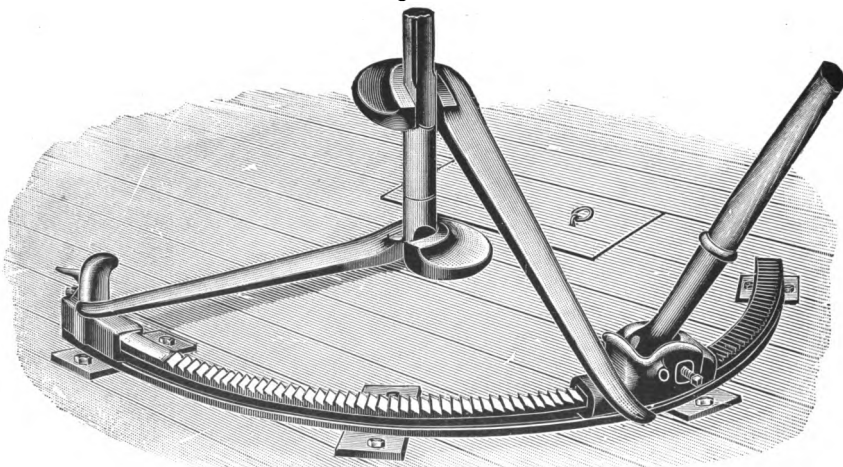
Wrenches under 200 pounds have lifting handles only; 200 pounds and heavier have lifting handles and eyes.

## LINERS OR BUSHINGS FOR TOOL WRENCHES

|                       |                 |                            |                 |
|-----------------------|-----------------|----------------------------|-----------------|
| 4 x 3½ inches - - - - | per set, \$5 00 | 5 x 4 inches - - - -       | per set, \$8 00 |
| 4½ x 4 inches - - - - | per set, 6 50   | 5½ x 4 or 5 inches - - - - | per set, 8 50   |

## BARRETT PATENT OIL WELL JACK

Fig. 1641



For tools with squares under 4 inches, use a No. 1 jack; for 4 inches and over, use a No. 2.

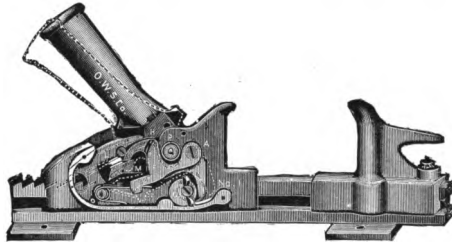
The Barrett oil well jack is a powerful and durable apparatus, which is almost indispensable. It is very easily put in position, and can be removed quickly when not in use. It has almost displaced the wrench circle and bar. With this jack joints can be set up with certainty and unscrewed with ease. Persons not familiar with the jack should be cautious not to apply too much power in setting up joints.

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## BARRETT PATENT OIL WELL JACK—No. 1

Fig. 1643

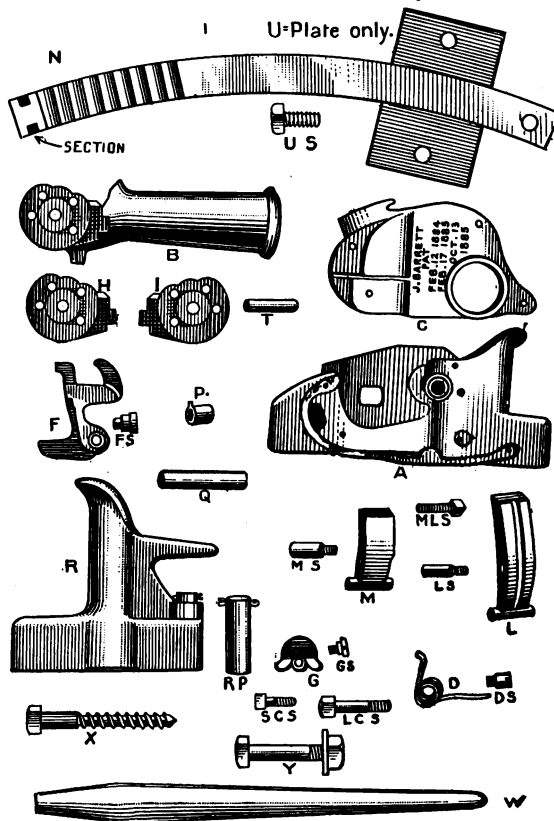


Weight, complete, 209 pounds

|                              |       |         |
|------------------------------|-------|---------|
| No. 1 jack, complete         | ----- | \$32 50 |
| Single acting jack, complete | ----- | 22 00   |

Fig. 1645

## NO. 1 OIL WELL JACK REPAIR PARTS.



For list of parts, see page 145.

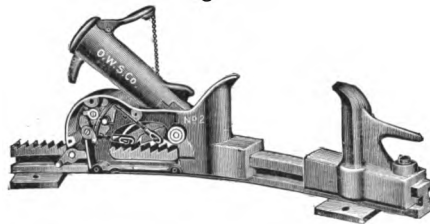


## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## BARRETT PATENT OIL WELL JACK—No. 2

Fig. 1647

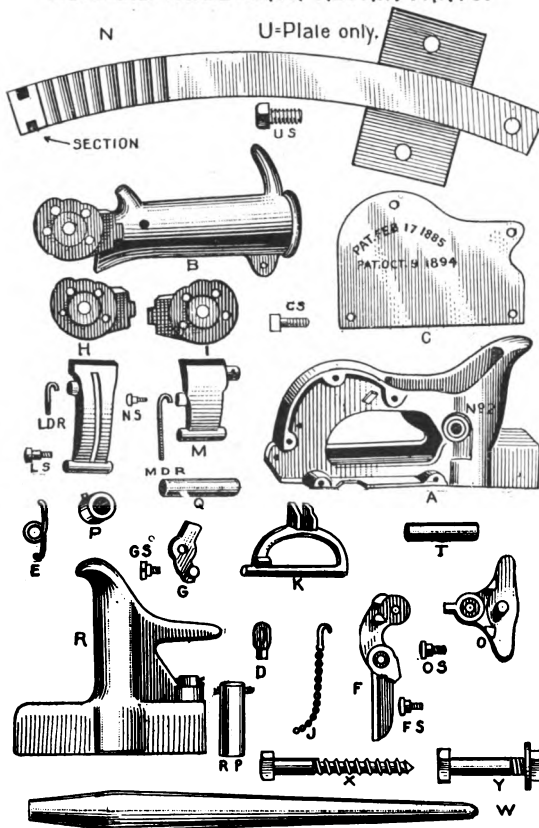


Weight, complete, 280 lbs.

No. 2 jack, complete - - - - - \$45 00

Fig. 1649

## NO. 2 OIL WELL JACK REPAIR PARTS.



For list of parts, see page 145.

**WELL DRILLING TOOLS****FOR CABLE SYSTEM****PARTS OF No. 1 AND SINGLE ACTING OIL WELL JACKS**

No. 1 jack illustrated on page 143.

| Symbol | Name of part                  | Price,<br>No. 1 | Price,<br>Single acting |
|--------|-------------------------------|-----------------|-------------------------|
| A      | Base or cage, complete        | \$16 00         | \$11 00                 |
| B      | Base or cage with bushings    | 6 00            | 5 00                    |
| C      | Socket lever with side plates | 2 75            | 2 75                    |
| D      | Shield                        | 1 00            | ---                     |
| DS     | Spring                        | 10              | ---                     |
| F      | Spring screw                  | 10              | ---                     |
| FS     | Brass lowering block          | 1 50            | ---                     |
| G      | Lowering block screw          | 10              | ---                     |
| GS     | Eccentric                     | 30              | ---                     |
| H      | Eccentric screw               | 10              | ---                     |
| I      | Right hand side plate         | 25              | 25                      |
| J      | Left hand side plate          | 25              | 25                      |
| L      | Long pawl only                | 1 75            | 1 75                    |
| LS     | Long pawl screw               | 10              | ---                     |
| LCS    | Long shield screw             | 05              | ---                     |
| M      | Short pawl only               | 1 50            | 1 50                    |
| MRS    | Short pawl reversing screw    | 10              | ---                     |
| MLS    | Short pawl lifting screw      | 10              | 10                      |
| N      | Steel rack and plates         | 16 00           | 16 00                   |
| P      | Bushings (2)                  | each 15         | 15                      |
| O      | Fulcrum pin                   | 25              | 25                      |
| RP     | Wrench post and pin           | 3 75            | 3 75                    |
| SCS    | Wrench post pin               | 25              | 25                      |
| T      | Short shield screw (3)        | each 05         | ---                     |
| U      | Socket lever rivet (2)        | each 05         | 05                      |
| US     | Rack plate (4)                | each 30         | 30                      |
| W      | Rack plate screw (8)          | each 10         | 10                      |
| X      | Wood handle                   | 30              | 30                      |
| Y      | Lag screw (3)                 | each 10         | 10                      |
|        | Bolt and washer (5)           | each 15         | 15                      |

**PARTS OF No. 2 OIL WELL JACKS**

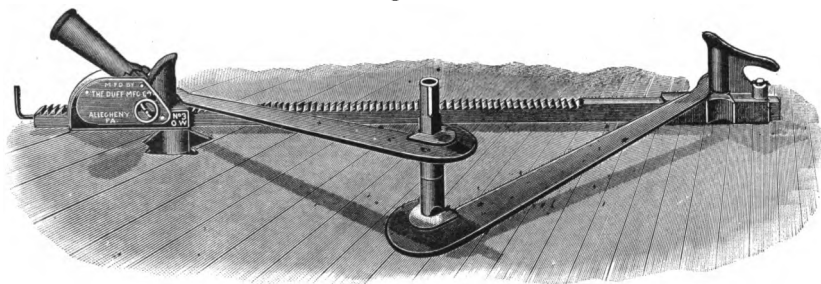
For illustrations, see page 144.

| Symbol | Name of part                  | Price   |
|--------|-------------------------------|---------|
| A      | Base or cage, complete        | \$21 00 |
| B      | Base or cage with bushings    | 9 00    |
| C      | Socket lever with side plates | 4 00    |
| CS     | Shield                        | 1 00    |
| D      | Shield screws (5)             | each 05 |
| E      | Adjusting link (2)            | each 20 |
| F      | Spring                        | 30      |
| FS     | Intermediate lever            | 25      |
| G      | Intermediate lever screw      | 10      |
| GS     | Reversing lever               | 20      |
| H      | Reversing lever screw         | 10      |
| I      | Right hand side plate         | 30      |
| J      | Left hand side plate          | 30      |
| K      | Carrying handle chain         | 50      |
| L      | Carrying handle               | 30      |
| LS     | Long pawl                     | 2 00    |
| LDR    | Long pawl screw               | 10      |
| M      | Long pawl rod                 | 15      |
| MS     | Short pawl                    | 1 75    |
| MDR    | Short pawl screw              | 10      |
| N      | Short pawl rod                | 15      |
| O      | Steel rack with plates        | 24 00   |
| OS     | Spring holder                 | 25      |
| P      | Spring holder screw           | 10      |
| PO     | Bushing (2)                   | each 20 |
| R      | Fulcrum                       | 30      |
| RP     | Wrench post and pin           | 4 75    |
| T      | Wrench post pin               | 25      |
| U      | Socket lever rivet (2)        | each 05 |
| US     | Rack plate (4)                | each 40 |
| W      | Rack plate screw (8)          | each 10 |
| X      | Wood handle                   | 35      |
| Y      | Lag screw (3)                 | each 10 |
|        | Bolt and washer (5)           | each 15 |

# BARRETT STRAIGHT LINE OIL WELL JACK

No. 3

Fig. 1650



Patented

No. 3 Jack, complete - - - - - \$30 00

Weight, 185 pounds

## PARTS

| Symbol | Name of part                             | Price  |
|--------|------------------------------------------|--------|
| ----   | Base or cage, with bushings - - - - -    | \$8 00 |
| P      | Bushings (2) - - - - - each              | 15     |
| Q      | Fulcrum pin - - - - -                    | 25     |
| ----   | Base or cage, complete - - - - -         | 18 00  |
| B      | Socket lever, with side plates - - - - - | 2 75   |
| H      | Right hand side plate - - - - -          | 25     |
| I      | Left hand side plate - - - - -           | 25     |
| T      | Socket lever rivet (2) - - - - - each    | 05     |
| W      | Wood handle - - - - -                    | 30     |
| L      | Long pawl only - - - - -                 | 1 75   |
| LS     | Long pawl screw - - - - -                | 10     |
| M      | Short pawl only - - - - -                | 1 50   |
| MRS    | Short pawl reversing screw - - - - -     | 10     |
| MLS    | Short pawl lifting screw - - - - -       | 10     |
| D      | Spring - - - - -                         | 10     |
| DS     | Spring screw - - - - -                   | 10     |
| C      | Shield - - - - -                         | 1 00   |
| SCS    | Short shield screw (3) - - - - - each    | 05     |
| LCS    | Long shield screw - - - - -              | 05     |
| F      | Brass lowering block - - - - -           | 1 50   |
| FS     | Lowering block screw - - - - -           | 10     |
| G      | Eccentric - - - - -                      | 30     |
| GS     | Eccentric screw - - - - -                | 10     |
| R      | Wrench post and pin - - - - -            | 3 75   |
| RP     | Wrench post pin - - - - -                | 25     |
| ----   | Steel rack - - - - -                     | 13 50  |
| ----   | Rack handle - - - - -                    | 30     |

WELL DRILLING TOOLS

Fig. 1635 FOR CABLE SYSTEM



WRENCH CIRCLE

Regular, 1/2 in. x 9 ft., weight 55 lbs. \$7 00  
Regular, 3/8 in. x 9 ft., weight 75 lbs. 9 25

Fig. 1637



WRENCH CIRCLE HOOK

Steel, weight 10 lbs. - - - - - \$3 00

Fig. 1639

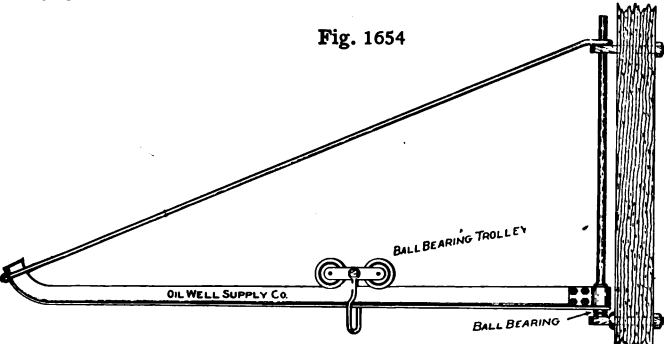


STEEL WRENCH BAR

|                  |        |        |       |      |       |
|------------------|--------|--------|-------|------|-------|
| Size - - - - -   | inches | 1 1/2  | 1 3/4 | 2    | 2 1/4 |
| Weight - - - - - | lbs.   | 50     | 58    | 67   | 75    |
| Price - - - - -  |        | \$3 50 | 4 00  | 4 50 | 5 50  |

The above outfit is little used, having been supplanted by Barrett's patent oil well jacks.  
See pages 142 to 146.

Fig. 1654



BALL BEARING  
DERRICK CRANE  
Extra Heavy.

Weight, 345 lbs.

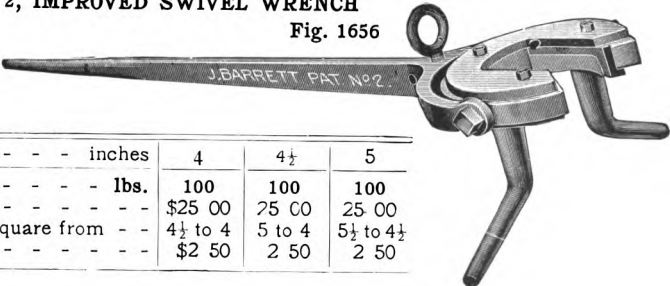
Crane and Trolley  
complete, each \$50 00

PARTS

Beam and Strap \$17 00  
B. B. Trolley - 20 00  
Eye Bolts, each 3 50  
Strain Rod - 4 00  
B. B. Washer - 2 50  
Upright Rod - 3 00

BARRETT No. 2, IMPROVED SWIVEL WRENCH

Fig. 1656



|                                        |        |            |        |                |
|----------------------------------------|--------|------------|--------|----------------|
| Size of square - - - - -               | inches | 4          | 4 1/2  | 5              |
| Weight - - - - -                       | lbs.   | 100        | 100    | 100            |
| Each - - - - -                         |        | \$25 00    | 25 00  | 25 00          |
| Extra plates to reduce square from - - |        | 4 1/2 to 4 | 5 to 4 | 5 1/2 to 4 1/2 |
| Each - - - - -                         |        | \$2 50     | 2 50   | 2 50           |

PARTS

|                              |        |                       |      |        |
|------------------------------|--------|-----------------------|------|--------|
| C. I. Ring - - - - -         | \$4 00 | Pivot Bolts - - - - - | each | \$0 50 |
| Mall " with handle - - - - - | 8 00   | Eye " - - - - -       | "    | 1 00   |
| W. I. " - - - - -            | 5 50   |                       |      |        |

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## DIFFERENTIAL PULLEY BLOCKS

## WESTON PATTERN DIRECT—Fig. 5330

Fig. 5330



| Size - - - - tons        | $\frac{1}{4}$ | $\frac{1}{2}$ | 1     | $1\frac{1}{2}$ | 2     | 3     |
|--------------------------|---------------|---------------|-------|----------------|-------|-------|
| Price - - - complete     | \$18 00       | 21 00         | 28 00 | 36 00          | 45 00 | 60 00 |
| Extra chain - - per foot | 75            | 80            | 85    | 90             | 95    | 1 00  |
| Weight - - - - lbs.      | 22            | 30            | 51    | 81             | 122   | 180   |

Fig. 5331

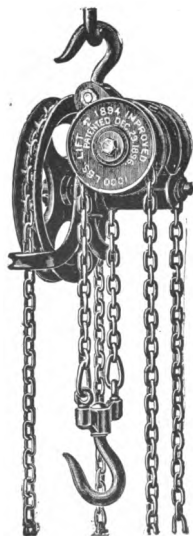


## MOORE ANTI-FRICTION—Fig. 5331

| Capacity                                   | Price complete, with chain | Extra main chain, per foot | Extra hand chain, per foot | Height of hoist, feet | Weight of block complete, with chains, lbs. | Shortest distance between hooks, inches |
|--------------------------------------------|----------------------------|----------------------------|----------------------------|-----------------------|---------------------------------------------|-----------------------------------------|
| No. 0. $\frac{1}{2}$ ton -                 | \$25 00                    | 40                         | 25                         | 7                     | 39                                          | 16                                      |
| No. 1. 1 ton -                             | 30 00                      | 44                         | 25                         | 8                     | 73                                          | 20                                      |
| No. $1\frac{1}{2}$ . $1\frac{1}{2}$ tons - | 40 00                      | 48                         | 25                         | $8\frac{1}{2}$        | 90                                          | 21                                      |
| No. 2. 2 tons -                            | 50 00                      | 52                         | 25                         | 9                     | 128                                         | 23                                      |
| No. 3. 3 tons -                            | 70 00                      | 60                         | 25                         | 10                    | 195                                         | 29                                      |
| No. 4. 4 tons -                            | 95 00                      | 70                         | 25                         | 11                    | 250                                         | 32                                      |
| No. 5. 5 tons -                            | 125 00                     | 80                         | 25                         | 12                    | 353                                         | 36                                      |
| No. 6. 6 tons -                            | 150 00                     | 80                         | 25                         | 12                    | 400                                         | 37                                      |
| No. 8. 8 tons -                            | 200 00                     | 1 25                       | 25                         | 12                    | 580                                         | 41                                      |
| No. 10. 10 tons -                          | 250 00                     | 1 25                       | 25                         | 12                    | 625                                         | 41                                      |
| No. 15. 15 tons -                          | 350 00                     | 1 50                       | 25                         | 12                    | 780                                         | 45                                      |

## HARRINGTON PATTERN HOIST

Fig. 5332



| Lift, feet | To raise, lbs. | Price   | Extra lift, per foot | Weight lbs. |
|------------|----------------|---------|----------------------|-------------|
| 8          | 500            | \$22 50 | 1 00                 | 35          |
| 8          | 1,000          | 25 00   | 1 20                 | 52          |
| 8          | 2,000          | 30 00   | 1 50                 | 65          |
| 8          | 3,000          | 40 00   | 1 75                 | 76          |
| 9          | 4,000          | 50 00   | 2 00                 | 140         |
| 10         | 6,000          | 75 00   | 2 20                 | 226         |
| 10         | 8,000          | 95 00   | 2 40                 | 258         |
| 12         | 10,000         | 140 00  | 3 00                 | 625         |
| 12         | 12,000         | 180 00  | 3 75                 | 750         |
| 12         | 16,000         | 210 00  | 4 00                 | 875         |
| 12         | 20,000         | 275 00  | 4 25                 | 925         |

## SPECTACLES FOR CARRYING BITS

Fig. 1695

Price - - - - - \$2 50

Weight, 8 pounds





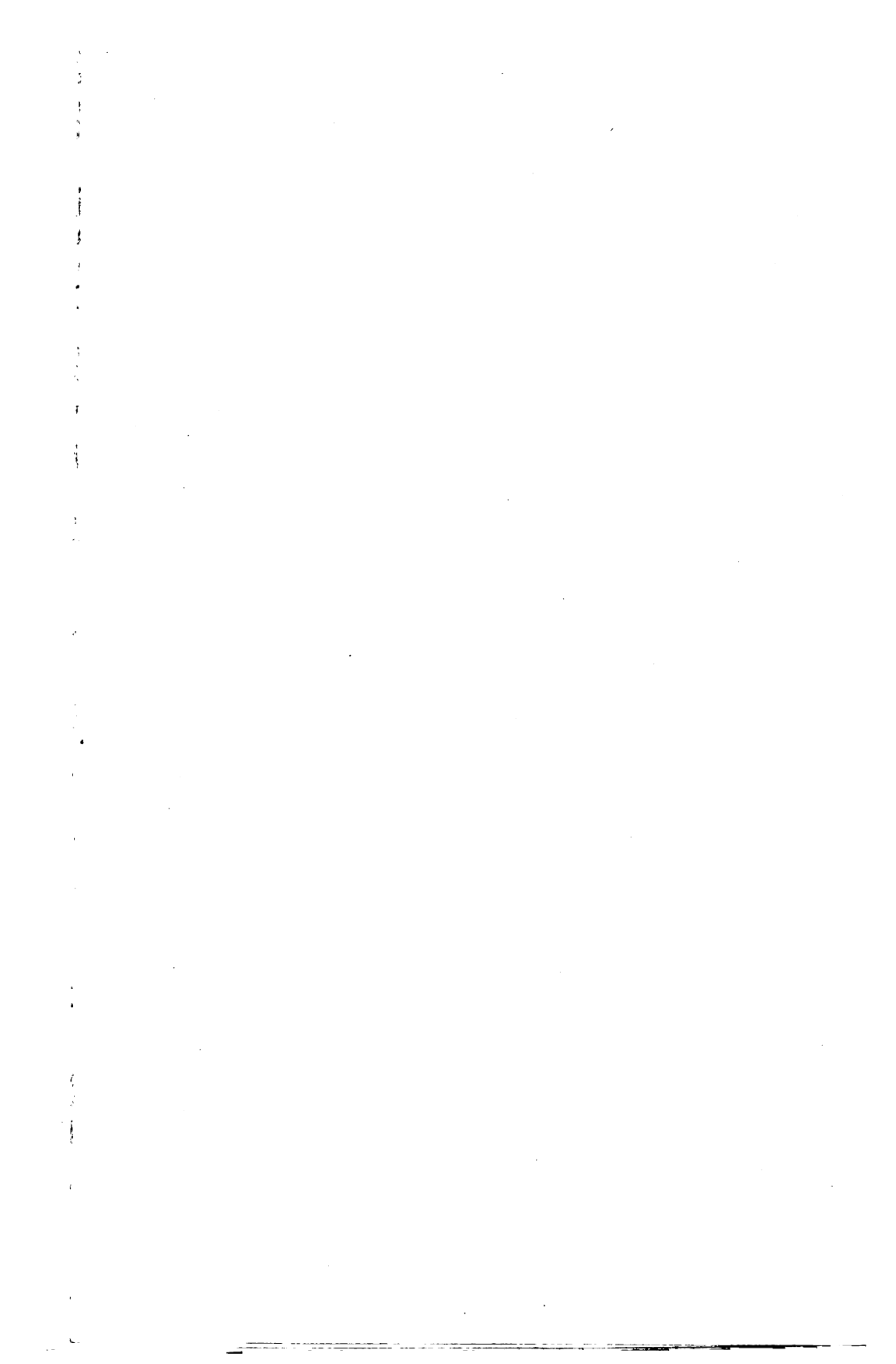


Fig. 1659

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## JOINTS

It has been shown in the foregoing pages that a similarity exists between all "strings" of tools used in the cable drilling process, but it is not an exaggeration to say that everything depends on the proper combination of the parts and the perfect fitting of joints. Any tool designed for use in the well must be equipped, at either one end or both, with a joint or means of attachment to the other parts of the "string." The taper joint has been found superior to the old style straight joint, and is now almost universally adopted, see Fig. 1659. The measurement is taken diametrically across the narrowest and widest part, thus, a 2x3 joint is one measuring 2 inches across the narrowest part, and 3 inches across the base, or widest part of the screw. The table on page 150 shows the sizes in common use. The threads may be either 7 or 8 to the inch, and the form may be either sharp "V" or flat. The joints must be provided with square or flat surfaces, on which the wrenches are placed for screwing up or taking apart. Hence we have three distinct specifications which must enter into a description of any drilling tool joint: **The measurement of the truncated cone or joint proper, the number and form of the thread, and the size of the square for the wrenches.** Unfortunately there is a variation in the standards of different manufacturers, and when tools are required for use in connection with other tools than those included in the order or shipment, the **maker's mark** must also be added to the description. The mark is usually stamped with steel dies in the largest part or collar of the joint.



8-thread sharp



7-thread sharp



7-thread flat



We have the templates of all reputable makers, and can supply new tools or repairs to suit as readily as our own special standards.

## EXAMPLE

For description, see Fig. 1659 for either box or pin end of joint, "2½ x 3½-8 sharp, 4-inch square O. W. S."

N. B.—We recommend the use of 7 threads flat.



## WELL DRILLING TOOLS

FOR CABLE SYSTEM

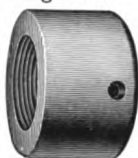
## BOX AND PIN TEMPLATES

## FINGER GAUGE

Fig. 1658

Fig. 1660

Fig. 1662



Box

Pin

|                                     | 1½ x 2  | 1½ x 2½ | 2 x 3 | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 3 x 4 | 3½ x 4½ | 3½ x 4½ | 4 x 5 |
|-------------------------------------|---------|---------|-------|---------|---------|---------|-------|---------|---------|-------|
| For joint - - -                     |         |         |       |         |         |         |       |         |         |       |
| Per set, figs. 1658, 1660, 1662 - - | \$11 50 | 13 50   | 16 00 | 17 50   | 19 00   | 20 50   | 22 50 | 24 00   | 26 50   | 29 00 |
| Weight - - lbs.                     | 10      | 15      | 20    | 30      | 35      | 40      | 45    | 50      | 55      | 60    |

## PATENT TAPER JOINTS

BOX  
Fig. 1665PIN  
Fig. 1663

Used on all tools unless otherwise ordered. 7 flat or 8 sharp threads to the inch

| Size - - inches      | 1½ x 2½ | 1½ x 2½ | 2 x 3 | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 3 x 4 | 3½ x 4½ | 3½ x 4½ | 4 x 5 |
|----------------------|---------|---------|-------|---------|---------|---------|-------|---------|---------|-------|
| Size squares, inches | 2½      | 2½      | 3½    | 3½      | 4       | 4       | 4½    | 5       | 5       | 5½    |
| Boxes, fig. 1665 - - | \$7 00  | 7 50    | 8 75  | 9 50    | 11 00   | 12 00   | 16 50 | 21 00   | 23 50   | 30 00 |
| Weight - - lbs.      | 40      | 45      | 60    | 80      | 100     | 110     | 140   | 150     | 160     | 170   |
| Pins, fig. 1663 - -  | \$5 25  | 5 75    | 7 50  | 8 25    | 10 00   | 10 50   | 15 50 | 20 00   | 21 50   | 29 00 |
| Weight - - lbs.      | 35      | 40      | 55    | 70      | 90      | 100     | 130   | 140     | 150     | 160   |

## PATENT TAPER JOINT

7 flat threads or 8 sharp threads to the inch

We do not advise using joints with larger collars than shown in accompanying table

| Size of hole  | Size of joint | Size of wrench square | Diameter of pin collar | Diameter of box collar |
|---------------|---------------|-----------------------|------------------------|------------------------|
| 3½ or 4 inch  | 1½ x 2 inch   | 2½ inch               | 2½ inch                | 3 inch                 |
| 4½ or 4½ inch | 1½ x 2½ inch  | 2½ inch               | 3½ inch                | 3½ inch                |
| 5 inch        | 2 x 3 inch    | 3½ inch               | 4½ inch                | 4½ inch                |
| 5½ inch       | 2½ x 3½ inch  | 3½ inch               | 4½ inch                | 4½ inch                |
| 6½ inch       | 2½ x 3½ inch  | 4 inch                | 5 inch                 | 5½ inch                |
| 6½ or 6½ inch | 2½ x 3½ inch  | 4 inch                | 5½ inch                | 5½ inch                |
| 7½ or 8½ inch | 3 x 4 inch    | 4½ inch               | 6 inch                 | 6½ inch                |
| 8 or larger   | 3½ x 4½ inch  | 5 inch                | 6½ inch                | 6½ inch                |
| 8 or larger   | 3½ x 4½ inch  | 5 inch                | 6½ inch                | 6½ inch                |
| 8 or larger   | 4 x 5 inch    | 5½ inch               | 7 inch                 | 7½ inch                |

Fig 1666

## SUBSTITUTE

FROM PIPE OR CASING TO TOOL JOINT  
WITH ROPE SOCKET NECK

| Size casing - - - - - inches | 5       | 5½      | 6½      | 6½      |
|------------------------------|---------|---------|---------|---------|
| Size tool joint - - - - -    | 2 x 3   | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ |
| Weight - - - - - lbs.        | 90      | 110     | 125     | 135     |
| Price - - - - - each         | \$15 50 | 19 00   | 22 50   | 24 00   |

**WELL DRILLING TOOLS****FOR CABLE SYSTEM****Fig. 1669****SUBSTITUTE**

| With joints        | Weight, lbs. | Price   | With joints        | Weight, lbs. | Price   |
|--------------------|--------------|---------|--------------------|--------------|---------|
| 1½ x 2½ to 2 x 3   | 65           | \$11 50 | 2½ x 3½ to 2½ x 3½ | 110          | \$14 25 |
| 2 x 3 to 2 x 3     | 85           | 11 75   | 2½ x 3½ to 2½ x 3½ | 120          | 15 00   |
| 2 x 3 to 2½ x 3½   | 90           | 12 25   | 2½ x 3½ to 2½ x 3½ | 125          | 16 00   |
| 2 x 3 to 2½ x 3½   | 110          | 15 00   | 2½ x 3½ to 3 x 4   | 175          | 19 00   |
| 2½ x 3½ to 2½ x 3½ | 100          | 12 75   | 2½ x 3½ to 3½ x 4½ | 200          | 22 00   |
| 2½ x 3½ to 2½ x 3½ | 100          | 13 50   | 2½ x 3½ to 3½ x 4½ | 210          | 23 00   |

**BOXES WITH SOLID OR SWIVEL EYE****Fig. 1679****Box with solid eye****Fig. 1677****Box with swivel eye****PINS WITH SOLID OR SWIVEL HOOK****Fig. 1673****Pin with solid hook****Fig. 1675****Pin with swivel hook**

| Size - - - - - inches                | 1½ x 2½ | 1½ x 2½ | 2 x 3 | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 3 x 4 | 3½ x 4½ |
|--------------------------------------|---------|---------|-------|---------|---------|---------|-------|---------|
| Size squares - - - - - inches        | 2½      | 2½      | 3½    | 3½      | 4       | 4       | 4½    | 5       |
| Box with solid eye, Fig. 1679 - -    | \$10 50 | 11 50   | 13 25 | 14 00   | 16 00   | 18 25   | 23 00 | 28 00   |
| Box with swivel eye, Fig. 1677 -     | 15 50   | 16 40   | 18 00 | 19 00   | 20 50   | 23 00   | 28 50 | 35 00   |
| Pin with solid hook, Fig. 1673 -     | 10 25   | 11 00   | 12 75 | 13 50   | 15 25   | 15 50   | 21 50 | 26 00   |
| Weight, each, Figs. 1679-77-73, lbs. | 40      | 45      | 60    | 80      | 100     | 110     | 140   | 150     |
| Pin with swivel hook, Fig. 1675 -    | 12 00   | 13 50   | 16 50 | 18 00   | 21 00   | 23 00   | 27 00 | 30 50   |
| Weight, each, Fig. 1675 - - lbs.     | 45      | 50      | 65    | 85      | 105     | 120     | 150   | 160     |

**THREAD PROTECTORS****FOR SEVEN FLAT OR EIGHT SHARP THREADS****Fig. 1657****For box****Fig. 1661****For pin**

| For size box or pin - - - | 1½ x 2 | 1½ x 2½ | 2 x 3 | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 3 x 4 | 3½ x 4½ | 3½ x 4½ |
|---------------------------|--------|---------|-------|---------|---------|---------|-------|---------|---------|
| Box protectors - - - - -  | \$0 40 | 45      | 55    | 55      | 60      | 80      | 1 00  | 1 00    | 1 15    |
| Pin protectors - - - - -  | 45     | 50      | 60    | 60      | 65      | 90      | 1 10  | 1 10    | 1 25    |

When ordering, state size of box or pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

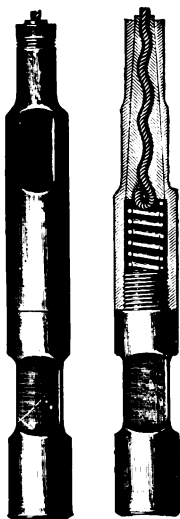
## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## SOCKETS FOR DRILLING WITH WIRE ROPE

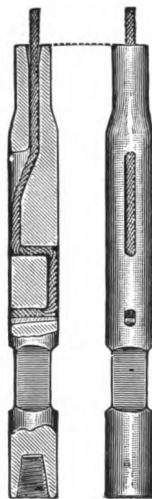
## O. W. S. CO. PATENT

Fig. 1577A



## RIGBY PATENT

Fig. 1577B



## BABCOCK

Fig. 1577D



| Size hole for - - - - - inches | 4½      | 5     | 5½      | 6       | 6½ and larger |
|--------------------------------|---------|-------|---------|---------|---------------|
| Size box - - - - - inches      | 1½ x 2½ | 2 x 3 | 2½ x 3½ | 2½ x 3½ | 2½ x 3½       |
| Fig. 1577A - - - - -           | \$35 00 | 36 00 | 36 00   | 45 00   | 45 00         |
| Weight - - - - - lbs           | 100     | 110   | 140     | 175     | 175           |
| Fig. 1577B - - - - -           | \$27 00 | 30 00 | 32 00   | 34 50   | 36 00         |
| Weight - - - - - lbs           | -----   | ----- | -----   | -----   | -----         |
| Fig. 1577D - - - - -           | -----   | 11 00 | 12 50   | 15 00   | 15 50         |
| Weight - - - - - lbs           | -----   | 55    | 65      | 80      | 80            |

The O. W. S. Co. patent socket is one of the simplest and best sockets in use. It can be adjusted or removed without loss of time. In attaching the socket, the sub-joint is unscrewed and the cone slips and spring withdrawn. The rope is then passed down through the socket. The end of the rope is hammered into a short loop to prevent its pulling through the socket. The slips are then adjusted and forced into position. The lower spring is then inserted and the upper and lower parts of the body screwed together. As the slips are conical, the greater the strain on the cable the tighter the grip. The spring acting between the pin end of the sub-joint and the lower end of the slips, prevents the loosening or jarring down of the slips.

When ordering, state size of box, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## ROPE SOCKETS AND PARTS

Fig. 1580



Patent

Fig. 1582



Sub

Fig. 1584



New Era

Fig. 1586



Wing

Fig. 1592



Bradford

Fig. 1588

Screw wedge  
for Bradford  
socket

Fig. 1597



Smith's patent

Fig. 1594

Fig. 1590

Wedge wrench for  
Bradford socketSlip for Smith's  
patent socket

| Size of box, inches | PATENT<br>Fig. 1580 |         | SUB<br>Fig. 1582 |       | NEW ERA<br>Fig. 1584 |       | WING<br>Fig. 1586 |       | BRADFORD<br>Fig. 1592 |       | SMITH<br>Fig. 1597 |       |
|---------------------|---------------------|---------|------------------|-------|----------------------|-------|-------------------|-------|-----------------------|-------|--------------------|-------|
|                     | Wt.,<br>lbs.        | Price   | Wt.,<br>lbs.     | Price | Wt.,<br>lbs.         | Price | Wt.,<br>lbs.      | Price | Wt.,<br>lbs.          | Price | Wt.,<br>lbs.       | Price |
| 1½ x 2½ - - -       | 50                  | \$11 00 | 100              | 22 50 | 110                  | 24 00 | 65                | 14 00 | 50                    | 21 00 | 110                | 21 50 |
| 2 x 3 - - -         | 60                  | 12 50   | 140              | 27 00 | 125                  | 21 00 | 90                | 17 00 | 60                    | 21 50 | 125                | 23 50 |
| 2½ x 3½ - - -       | 75                  | 15 00   | 175              | 29 00 | 150                  | 23 50 | 100               | 18 50 | 75                    | 22 50 | 150                | 26 50 |
| 2¾ x 3¾ - - -       | 75                  | 15 50   | 175              | 32 00 | 150                  | 24 50 | 110               | 19 50 | 75                    | 25 00 | 150                | 27 50 |
| 3 x 4 - - -         | 100                 | 19 50   | ---              | ---   | 200                  | 32 00 | 125               | 23 00 | 100                   | 27 00 | 200                | 36 00 |
| 3½ x 4½ - - -       | 110                 | 22 50   | ---              | ---   | 220                  | 35 50 | ---               | ---   | ---                   | ---   | 220                | 40 50 |

|                                                         |   |   |   |   |   |   |   |   |   |   |           |        |
|---------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|-----------|--------|
| Screw wedge for Bradford rope socket, fig. 1588 -       | - | - | - | - | - | - | - | - | - | - | -         | \$3 00 |
| Wedge wrench for Bradford rope socket, fig. 1590 -      | - | - | - | - | - | - | - | - | - | - | -         | 2 50   |
| Extra slips for Smith's patent rope socket, fig. 1594 - | - | - | - | - | - | - | - | - | - | - | per pair, | 1 50   |
| Extra set screws -                                      | - | - | - | - | - | - | - | - | - | - | -         | 25     |

## DRILLING JARS

For fishing jars, see page 162.

Fig. 1599



4½-Inch stroke. Patented April 24, 1900

| Diameter - - - inches                 | 3½      | 3¾    | 4¾    | 5¾            | 5¾    | 5¾    | 6¾            | 6¾            | 6¾            | 7             |
|---------------------------------------|---------|-------|-------|---------------|-------|-------|---------------|---------------|---------------|---------------|
| Size of hole to drill in - - - inches | 4¾      | 4¾    | 5     | 5¾            | 6¾    | 6¾    | 7¾ and larger | 7¾ and larger | 7¾ and larger | 7¾ and larger |
| Size box and pin - - - inches         | 1½x2½   | 1½x2½ | 2 x 3 | 2½x3 or 2¾x3¾ | 2¾x3¾ | 2¾x3¾ | 2¾x3¾         | 2¾x3¾         | 2¾x3¾         | 2¾x3¾         |
| Weight - - - lbs.                     | 100     | 125   | 200   | 300           | 300   | 325   | 450           | 500           | 550           | 600           |
| Per set - - -                         | \$60 00 | 62 00 | 70 00 | 83 00         | 83 00 | 87 00 | 111 00        | 117 00        | 123 00        | 130 00        |

When ordering, state size of box or pin, style of taper, number of threads to inch (flat or sharp), size of wrench square: also diameter of hole in which tool is to be used.

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## AUGER STEMS AND SINKER BARS

SINKER BAR—Fig. 1601



6 to 14 feet long.

| Size                    | WITH 1½" x 2½" BOX AND PIN |     |     |     | WITH 2" x 3" BOX AND PIN |     |     |     | WITH 2½" x 3½" BOX AND PIN |     |     |     | WITH 2½" x 3½" PIN AND 3" x 4" BOX |     |     |     |
|-------------------------|----------------------------|-----|-----|-----|--------------------------|-----|-----|-----|----------------------------|-----|-----|-----|------------------------------------|-----|-----|-----|
|                         | 2½"                        | 3"  | 3½" | 4"  | 4½"                      | 5"  | 5½" | 6"  | 6½"                        | 7"  | 7½" | 8"  | 8½"                                | 9"  | 9½" | 10" |
| Weight, per foot - lbs. | 20                         | 24  | 28  | 33  | 38                       | 43  | 49  | 55  | 68                         | 75  | 82  | 90  |                                    |     |     |     |
| 6 feet long -           | 819                        | 75  | 20  | 25  | 22                       | 00  | 26  | 25  | 28                         | 00  | 28  | 75  | 36                                 | 25  | 37  | 00  |
| 8 feet long -           | 21                         | 00  | 21  | 75  | 24                       | 00  | 28  | 25  | 30                         | 75  | 31  | 75  | 40                                 | 00  | 41  | 00  |
| 10 feet long -          | 22                         | 25  | 23  | 50  | 25                       | 75  | 30  | 50  | 33                         | 25  | 34  | 75  | 43                                 | 50  | 45  | 00  |
| 12 feet long -          | 23                         | 75  | 25  | 00  | 27                       | 75  | 32  | 75  | 36                         | 00  | 37  | 75  | 47                                 | 00  | 49  | 00  |
| 14 feet long -          | 24                         | 75  | 26  | 75  | 29                       | 50  | 35  | 00  | 38                         | 75  | 40  | 75  | 50                                 | 50  | 53  | 00  |
| 16 feet long -          | 26                         | 00  | 28  | 25  | 31                       | 50  | 37  | 25  | 41                         | 25  | 43  | 75  | 54                                 | 00  | 57  | 00  |
| 18 feet long -          | 27                         | 25  | 29  | 75  | 33                       | 25  | 39  | 25  | 44                         | 00  | 46  | 75  | 57                                 | 75  | 61  | 00  |
| 20 feet long -          | 28                         | 75  | 31  | 50  | 35                       | 25  | 41  | 50  | 46                         | 50  | 49  | 50  | 61                                 | 25  | 65  | 00  |
| 22 feet long -          | 30                         | 00  | 33  | 00  | 37                       | 00  | 43  | 75  | 49                         | 25  | 52  | 75  | 64                                 | 75  | 69  | 00  |
| 24 feet long -          | 31                         | 25  | 34  | 75  | 39                       | 00  | 45  | 75  | 51                         | 75  | 55  | 75  | 68                                 | 25  | 73  | 75  |
| 26 feet long -          | 32                         | 25  | 36  | 25  | 41                       | 00  | 48  | 00  | 54                         | 50  | 58  | 75  | 72                                 | 00  | 77  | 25  |
| 28 feet long -          | 33                         | 75  | 38  | 00  | 42                       | 75  | 50  | 25  | 57                         | 00  | 61  | 75  | 75                                 | 50  | 81  | 25  |
| 30 feet long -          | 35                         | 00  | 39  | 50  | 44                       | 75  | 52  | 50  | 59                         | 75  | 64  | 75  | 79                                 | 00  | 85  | 25  |
| 32 feet long -          | 36                         | 25  | 41  | 00  | 46                       | 50  | 54  | 50  | 62                         | 25  | 67  | 75  | 82                                 | 50  | 89  | 25  |
| 34 feet long -          | 37                         | 50  | 42  | 75  | 48                       | 50  | 56  | 75  | 65                         | 00  | 70  | 75  | 86                                 | 25  | 93  | 25  |
| 36 feet long -          | 38                         | 75  | 44  | 25  | 50                       | 25  | 59  | 00  | 67                         | 75  | 73  | 75  | 89                                 | 75  | 97  | 25  |
| 38 feet long -          | 40                         | 00  | 46  | 00  | 52                       | 25  | 61  | 00  | 70                         | 25  | 76  | 75  | 93                                 | 25  | 101 | 25  |
| 40 feet long -          | 41                         | 50  | 47  | 50  | 54                       | 00  | 63  | 25  | 73                         | 00  | 79  | 75  | 96                                 | 75  | 105 | 25  |
| 42 feet long -          | 42                         | 75  | 49  | 00  | 56                       | 00  | 65  | 50  | 75                         | 50  | 82  | 75  | 100                                | 50  | 109 | 25  |
| 44 feet long -          | ---                        | --- | --- | --- | ---                      | --- | --- | --- | ---                        | --- | --- | --- | ---                                | --- | --- | --- |
| 45 feet long -          | ---                        | --- | --- | --- | ---                      | --- | --- | --- | ---                        | --- | --- | --- | ---                                | --- | --- | --- |
| 46 feet long -          | ---                        | --- | --- | --- | ---                      | --- | --- | --- | ---                        | --- | --- | --- | ---                                | --- | --- | --- |
| 48 feet long -          | ---                        | --- | --- | --- | ---                      | --- | --- | --- | ---                        | --- | --- | --- | ---                                | --- | --- | --- |

AUGER STEM—Fig. 1603



16 to 48 feet long.

Stems are f. o. b. cars, Pittsburgh, Pa. At branch machine shops, add freight.

For specifications of joints generally used, see page 150. When ordering, state size of box or pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

## WELL DRILLING TOOLS

FOR CABLE SYSTEM  
SPUDDING BITS

Fig. 1605

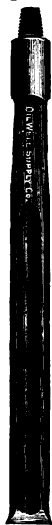


| Size of hole,<br>inches | Size of pin,<br>inches            | Amount<br>of steel each,<br>lbs. | Total<br>weight each,<br>lbs. | Price,<br>each |
|-------------------------|-----------------------------------|----------------------------------|-------------------------------|----------------|
| 10                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 80                               | 250                           | \$37 00        |
| 12                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 80                               | 300                           | 40 00          |
| 12                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 100                              | 350                           | 43 00          |
| 13                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 80                               | 350                           | 43 00          |
| 13                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 100                              | 400                           | 45 50          |
| 13                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 120                              | 450                           | 48 50          |
| 13                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 150                              | 500                           | 52 50          |
| 14                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 80                               | 400                           | 46 50          |
| 14                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 100                              | 450                           | 49 50          |
| 14                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 120                              | 500                           | 52 00          |
| 16                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 100                              | 500                           | 57 00          |
| 16                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 150                              | 550                           | 64 00          |
| 16                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 200                              | 600                           | 71 00          |
| 18                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 150                              | 650                           | 73 00          |
| 18                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 200                              | 700                           | 80 00          |
| 18                      | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 250                              | 750                           | 87 00          |

## DRILLING BITS

Bits are sold in pairs or sets of two

Fig. 1609



Regular form of 4 $\frac{1}{4}$  to 6 $\frac{3}{8}$  inch bits. From 4 to 6 feet in length.

Fig. 1604

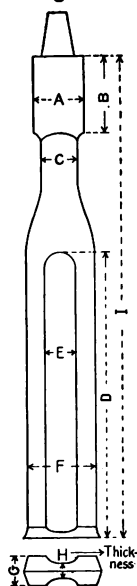


Fig. 1607



Regular form of 7 $\frac{3}{8}$  and larger. From 4 $\frac{1}{2}$  to 5 $\frac{1}{2}$  feet in length.

When other than standard or stock bits are required, measurements conforming to the diagram, fig. 1604, should be given.

A—Diameter of collar.

D—Length of water channel. G—Thickness of blade.

B—Length of collar.

E—Width of water channel. H—Thickness of bit in channel.

C—Size of wrench square.

F—Width of blade.

I—Length of bit.

Also state size of pin, style of taper, number of threads to the inch, sharp or flat.

## WELL DRILLING TOOLS

## FOR CABLE SYSTEM

DRILLING BITS—Figs. 1607-9. Prices in this list are per set (2)

| Size hole, inches | Size pin, inches | Amount of steel, each, lbs. | Total weight per set, lbs. | Price, per set (2) | Size hole, inches | Size pin, inches | Amount of steel, each, lbs. | Total weight per set, lbs. | Price, per set (2) |
|-------------------|------------------|-----------------------------|----------------------------|--------------------|-------------------|------------------|-----------------------------|----------------------------|--------------------|
| 4 or 4½           | 1½ x 2½          | 40                          | 200                        | \$39 00            | 8½                |                  | 80                          | 600                        | \$68 00            |
| 4 or 4½           |                  | 50                          | 210                        | 40 50              | 8½                |                  | 90                          | 650                        | 71 00              |
| 4 or 4½           |                  | 60                          | 225                        | 42 50              | 8½                |                  | 100                         | 700                        | 73 50              |
| 4 or 4½           |                  | 80                          | 250                        | 47 50              | 8½                |                  | 110                         | 725                        | 76 00              |
| 4½                |                  | 40                          | 290                        | 40 00              | 8½                |                  | 120                         | 750                        | 79 00              |
| 4½                | 2 x 3            | 50                          | 300                        | 42 00              | 8½                |                  | 130                         | 765                        | 84 50              |
| 4½                |                  | 60                          | 315                        | 44 00              | 8½                |                  | 140                         | 780                        | 88 00              |
| 4½                |                  | 80                          | 350                        | 48 50              | 8½                |                  | 150                         | 800                        | 91 00              |
| 5                 |                  | 60                          | 340                        | 46 50              | 8½                |                  | 175                         | 900                        | 98 00              |
| 5                 |                  | 70                          | 350                        | 48 50              | 8½                |                  | 200                         | 1,000                      | 105 00             |
| 5                 | 2 x 3 or 2½ x 3½ | 80                          | 360                        | 51 00              | 8½                |                  | 250                         | 1,100                      | 119 00             |
| 5                 |                  | 90                          | 370                        | 53 00              | 8½                |                  | 300                         | 1,200                      | 133 00             |
| 5                 |                  | 100                         | 380                        | 55 00              | 9½                |                  | 200                         | 1,050                      | 108 50             |
| 5                 |                  | 120                         | 390                        | 60 00              | 10                |                  | 100                         | 800                        | 85 50              |
| 5                 |                  | 60                          | 350                        | 49 00              | 10                |                  | 120                         | 850                        | 91 00              |
| 5                 | 2 x 3 or 2½ x 3½ | 70                          | 360                        | 51 50              | 10                |                  | 130                         | 865                        | 94 00              |
| 5                 |                  | 80                          | 370                        | 54 00              | 10                |                  | 140                         | 880                        | 96 50              |
| 5                 |                  | 90                          | 380                        | 56 00              | 10                |                  | 150                         | 900                        | 99 50              |
| 5                 |                  | 100                         | 400                        | 58 50              | 10                |                  | 175                         | 1,000                      | 106 50             |
| 5                 |                  | 120                         | 430                        | 63 50              | 10                |                  | 200                         | 1,100                      | 113 50             |
| 5                 | 2 x 3 to 2½ x 3½ | 150                         | 450                        | 70 50              | 10                |                  | 250                         | 1,200                      | 127 00             |
| 6½                |                  | 70                          | 450                        | 55 50              | 10                |                  | 300                         | 1,300                      | 141 00             |
| 6½                |                  | 80                          | 470                        | 58 00              | 10½               |                  | 200                         | 1,120                      | 118 00             |
| 6½                |                  | 90                          | 485                        | 61 00              | 11                |                  | 100                         | 875                        | 98 00              |
| 6½                |                  | 100                         | 500                        | 65 50              | 11                |                  | 150                         | 925                        | 104 00             |
| 6½                | 2 x 3 to 2½ x 3½ | 120                         | 550                        | 71 00              | 12                |                  | 120                         | 900                        | 100 00             |
| 6½                |                  | 130                         | 560                        | 76 00              | 12                |                  | 150                         | 1,000                      | 109 00             |
| 6½                |                  | 140                         | 580                        | 78 50              | 12                |                  | 175                         | 1,100                      | 115 50             |
| 6½                |                  | 150                         | 600                        | 81 50              | 12                |                  | 200                         | 1,250                      | 122 50             |
| 6½                |                  | 175                         | 625                        | 88 00              | 12                |                  | 250                         | 1,350                      | 136 50             |
| 6½                | 2½ x 3½          | 200                         | 650                        | 95 00              | 12                |                  | 300                         | 1,450                      | 151 00             |
| 6½                |                  | 100                         | 550                        | 70 00              | 12                |                  | 350                         | 1,550                      | 165 00             |
| 6½                |                  | 110                         | 575                        | 73 00              | 13                |                  | 100                         | 900                        | 100 00             |
| 6½                |                  | 120                         | 600                        | 76 00              | 13                |                  | 120                         | 1,000                      | 106 00             |
| 6½                |                  | 130                         | 615                        | 78 50              | 13                |                  | 150                         | 1,100                      | 114 00             |
| 6½                | 2½ x 3½          | 140                         | 630                        | 81 50              | 13                |                  | 175                         | 1,200                      | 121 00             |
| 6½                |                  | 150                         | 650                        | 84 00              | 13                |                  | 200                         | 1,350                      | 128 00             |
| 6½                |                  | 175                         | 665                        | 91 00              | 13                |                  | 250                         | 1,500                      | 142 00             |
| 6½                |                  | 200                         | 675                        | 98 00              | 13                |                  | 300                         | 1,600                      | 156 00             |
| 7                 |                  | 100                         | 650                        | 73 50              | 13                |                  | 400                         | 1,700                      | 184 00             |
| 7                 | 2½ x 3½          | 110                         | 675                        | 77 00              | 14                |                  | 150                         | 1,150                      | 124 00             |
| 7                 |                  | 120                         | 700                        | 80 00              | 14                |                  | 200                         | 1,400                      | 135 00             |
| 7                 |                  | 130                         | 715                        | 83 00              | 14                |                  | 250                         | 1,550                      | 146 00             |
| 7                 |                  | 140                         | 730                        | 85 50              | 14                |                  | 300                         | 1,650                      | 156 00             |
| 7                 |                  | 150                         | 750                        | 88 00              | 14                |                  | 400                         | 1,750                      | 197 00             |
| 7                 | 2½ x 3½          | 175                         | 800                        | 95 00              | 16                |                  | 250                         | 1,600                      | 168 00             |
| 7                 |                  | 200                         | 900                        | 102 00             | 16                |                  | 300                         | 1,750                      | 182 00             |
| 7                 |                  | 300                         | 1,100                      | 130 00             | 18                |                  | 250                         | 1,700                      | 174 00             |
| 7                 |                  |                             |                            |                    | 18                |                  | 300                         | 1,800                      | 195 00             |
| 7                 |                  |                             |                            |                    | 18                |                  |                             |                            |                    |

Total weights are approximate.



BIT GAUGE—Fig. 1615

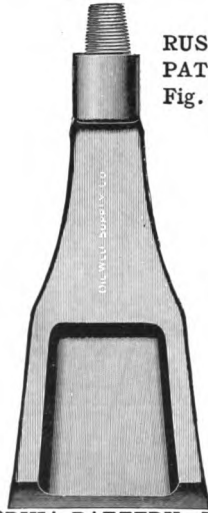
| Size - - - inches | 4. 4¼ or 4½ | 4¾ & 5 | 5½   | 6 or 6¼ | 6½   | 7½   | 8 or 8¾ | 9¾ or 10 | 11¾ or 12 | 13   | 14   | 16   | 18   | 20   |
|-------------------|-------------|--------|------|---------|------|------|---------|----------|-----------|------|------|------|------|------|
| Weight - - - lbs. | 1.5         | 2.     | 3.   | 3.3     | 3.5  | 3.8  | 4.      | 4.2      | 4.5       | 5    | 5.5  | 6    | 7    | 8    |
| Each - - - -      | \$0 95      | 1 05   | 1 15 | 1 20    | 1 30 | 1 40 | 1 50    | 1 60     | 1 80      | 2 15 | 2 35 | 2 50 | 3 30 | 3 75 |

# WELL DRILLING TOOLS

FOR CABLE SYSTEM  
DRILLING BITS



CALIFORNIA  
PATTERN,  
Fig. 1612



RUSSIAN  
PATTERN,  
Fig. 1614

MOTHER HUBBARD  
PATTERN, Fig. 1616



CALIFORNIA PATTERN—Fig. 1612

Prices in this list are per set of two.

| Size of hole - - - - inches      | 4 1/4   | 5 1/8 | 5 3/8 | 7 1/8 | 7 3/8 | 7 7/8 | 7 3/4  | 7 1/2  | 8      | 9 1/8 | 9 3/8  |
|----------------------------------|---------|-------|-------|-------|-------|-------|--------|--------|--------|-------|--------|
| Length - - - - - feet            | 5 1/2   | 5 1/2 | 5 1/2 | 5 1/2 | 5 1/2 | 5 1/2 | 5 1/2  | 6      | 6      | 5 1/2 | 5 1/2  |
| Amount of steel, each - - pounds | 60      | 100   | 120   | 120   | 130   | 150   | 200    | 200    | 200    | 150   | 175    |
| Total weight per set - - pounds  | 380     | 400   | 430   | 750   | 750   | 800   | 900    | 1100   | 1150   | 1100  | 1100   |
| Per set (2) - - - - -            | \$45 50 | 60 50 | 65 00 | 83 00 | 84 50 | 91 00 | 105 00 | 112 00 | 103 00 | 99 00 | 110 00 |

| Size of hole - - - - inches      | 9 1/8    | 9 3/8  | 9 7/8  | 10     | 11 1/8 | 11 3/8 | 11 7/8 | 11 3/4 | 11 1/2 | 11 1/8 | 11 3/8 |
|----------------------------------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Length - - - - - feet            | 5 1/2    | 5 1/2  | 5 1/2  | 6      | 6      | 4 1/2  | 4 1/2  | 4 1/2  | 5      | 5 1/2  | 5 1/2  |
| Amount of steel, each - - pounds | 200      | 250    | 300    | 300    | 250    | 150    | 175    | 200    | 200    | 250    | 300    |
| Total weight per set - - pounds  | 1200     | 1200   | 1200   | 1380   | 1400   | 1000   | 1000   | 1000   | 1120   | 1400   | 1400   |
| Per set (2) - - - - -            | \$117 00 | 130 00 | 144 00 | 153 00 | 137 00 | 109 00 | 116 00 | 123 00 | 130 00 | 151 00 | 165 00 |

| Size of hole - - - - inches      | 11 3/8   | 11 7/8 | 11 3/4 | 12 1/2 | 14     | 14     | 14     | 14     | 14     | ..... | ..... |
|----------------------------------|----------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| Length - - - - - feet            | 5 1/2    | 5 1/2  | 6      | 5 1/2  | 5      | 5 1/2  | 5 1/2  | 5 1/2  | 6      | ..... | ..... |
| Amount of steel, each - - pounds | 350      | 400    | 400    | 250    | 250    | 300    | 350    | 400    | 400    | ..... | ..... |
| Total weight per set - - pounds  | 1600     | 1600   | 1720   | 1500   | 1600   | 1800   | 1800   | 1800   | 1860   | ..... | ..... |
| Per set (2) - - - - -            | \$178 00 | 192 00 | 208 00 | 152 00 | 171 00 | 184 00 | 200 00 | 212 00 | 231 00 | ..... | ..... |

RUSSIAN PATTERN—Fig. 1614

| Size of hole - - inches   | 6             | 8             | 10            | 12            | 14            | 16            | 18            | 20            | 22            | 24            |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Size of pin - - inches    | 2 3/4 x 3 3/4 | 2 3/4 x 3 3/4 | 2 3/4 x 3 3/4 | 2 3/4 x 3 3/4 | 2 3/4 x 3 3/4 | 2 3/4 x 3 3/4 | 2 3/4 x 3 3/4 | 2 3/4 x 3 3/4 | 2 3/4 x 3 3/4 | 2 3/4 x 3 3/4 |
| Am't of steel, each, lbs. | 100           | 125           | 150           | 150           | 200           | 200           | 250           | 250           | 300           | 300           |
| Total wt. per set, lbs.   | 480           | 525           | 600           | 680           | 730           | 800           | 920           | 1050          | 1280          | 1350          |
| Per set (2) - - - - -     | \$72 00       | 87 50         | 104 00        | 112 00        | 126 00        | 134 00        | 155 00        | 168 00        | 192 00        | 205 00        |

MOTHER HUBBARD PATTERN—Fig. 1616

| Size of hole - - - inches       | 7 1/8   | 7 3/8 | 7 7/8 | 7 3/4  | 8 1/8 | 8 3/8 | 8 7/8 | 8 3/4 | 8 1/2 | 8 1/8  | 8 3/8  |
|---------------------------------|---------|-------|-------|--------|-------|-------|-------|-------|-------|--------|--------|
| Amount of steel each - - pounds | 100     | 120   | 150   | 200    | 80    | 90    | 100   | 150   | 175   | 200    | 250    |
| Total weight per set - - pounds | 700     | 750   | 800   | 950    | 650   | 700   | 750   | 800   | 850   | 950    | 1150   |
| Per set (2) - - - - -           | \$78 00 | 84 00 | 92 00 | 107 50 | 75 00 | 78 00 | 81 00 | 87 00 | 95 50 | 103 00 | 125 00 |

| Size of hole - - - inches     | 8 1/4    | 10    | 10     | 10     | 10     | 10     | 10     | 10     | 13     | 13     | 13     | 13     |
|-------------------------------|----------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Amount of steel, each, pounds | 300      | 100   | 120    | 150    | 175    | 200    | 250    | 120    | 150    | 200    | 250    | 300    |
| Total weight per set, pounds  | 1250     | 850   | 900    | 950    | 1050   | 1150   | 1250   | 1350   | 1150   | 1400   | 1550   | 1650   |
| Per set (2) - - - - -         | \$140 00 | 94 00 | 100 00 | 109 50 | 117 00 | 125 00 | 140 00 | 155 50 | 125 50 | 140 50 | 156 00 | 171 50 |

Total weights are approximate.

**DRILLING BITS—ALL STEEL** { 5 inch and smaller - - - - - per pound, \$0 14 1/4  
5 1/8, 6 1/8, and 6 3/8 inch - - - - - per pound, 13  
7 3/8 inch and larger - - - - - per pound, 12 1/2

When ordering, state size of pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.





## WELL DRILLING TOOLS

FOR CABLE SYSTEM

STAR BIT—Fig. 1687

|                                |                                   |                                   |       |                                   |                                   |
|--------------------------------|-----------------------------------|-----------------------------------|-------|-----------------------------------|-----------------------------------|
| Size of hole - - - - - inches  | 4 $\frac{1}{4}$                   | 4 $\frac{1}{2}$                   | 5     | 5 $\frac{5}{8}$                   | 6 $\frac{1}{4}$                   |
| Size of pin - - - - - inches   | 1 $\frac{5}{8}$ x 2 $\frac{1}{2}$ | 1 $\frac{5}{8}$ x 2 $\frac{1}{2}$ | 2 x 3 | 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
| Amount of steel - - - - - lbs. | 80                                | 80                                | 80    | 100                               | 125                               |
| Total weight - - - - - lbs.    | 150                               | 180                               | 210   | 250                               | 325                               |
| Each - - - - -                 | \$35 50                           | 37 00                             | 40 00 | 46 00                             | 59 50                             |

|                                |                                   |                                   |                                                                              |                                                                              |                                                                              |
|--------------------------------|-----------------------------------|-----------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Size of hole - - - - - inches  | 6 $\frac{5}{8}$                   | 7 $\frac{5}{8}$                   | 8 $\frac{1}{4}$                                                              | 10                                                                           | 12                                                                           |
| Size of pin - - - - - inches   | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$<br>to<br>3 $\frac{1}{4}$ x 4 $\frac{1}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$<br>to<br>3 $\frac{1}{4}$ x 4 $\frac{1}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$<br>to<br>3 $\frac{1}{4}$ x 4 $\frac{1}{4}$ |
| Amount of steel - - - - - lbs. | 125                               | 125                               | 125                                                                          | 150                                                                          | 200                                                                          |
| Total weight - - - - - lbs.    | 350                               | 420                               | 450                                                                          | 550                                                                          | 650                                                                          |
| Each - - - - -                 | \$63 00                           | 68 50                             | 72 00                                                                        | 86 50                                                                        | 106 00                                                                       |

ROUND REAMER—Fig. 1690

|                                |                                   |                                   |       |       |                                   |
|--------------------------------|-----------------------------------|-----------------------------------|-------|-------|-----------------------------------|
| Size of hole - - - - - inches  | 4 $\frac{1}{4}$                   | 4 $\frac{1}{2}$                   | 5     | 5     | 5 $\frac{5}{8}$                   |
| Size of pin - - - - - inches   | 1 $\frac{5}{8}$ x 2 $\frac{1}{2}$ | 1 $\frac{5}{8}$ x 2 $\frac{1}{2}$ | 2 x 3 | 2 x 3 | 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ |
| Amount of steel - - - - - lbs. | 50                                | 50                                | 60    | 80    | 80                                |
| Total weight - - - - - lbs.    | 150                               | 175                               | 200   | 225   | 240                               |
| Each - - - - -                 | \$30 50                           | 32 00                             | 36 50 | 38 50 | 42 50                             |

|                                |                                   |                                   |                                   |                                   |                                   |
|--------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size of hole - - - - - inches  | 5 $\frac{5}{8}$                   | 6 $\frac{1}{4}$                   | 6 $\frac{1}{4}$                   | 6 $\frac{5}{8}$                   | 7 $\frac{5}{8}$                   |
| Size of pin - - - - - inches   | 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
| Amount of steel - - - - - lbs. | 100                               | 80                                | 100                               | 100                               | 100                               |
| Total weight - - - - - lbs.    | 260                               | 300                               | 350                               | 380                               | 400                               |
| Each - - - - -                 | \$45 00                           | 46 00                             | 49 00                             | 51 00                             | 57 00                             |

|                                |                                   |                                   |                                   |                                   |                                   |
|--------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size of hole - - - - - inches  | 8 $\frac{1}{4}$                   | 8 $\frac{1}{4}$                   | 8 $\frac{1}{4}$                   | 9 $\frac{5}{8}$                   | 10                                |
| Size of pin - - - - - inches   | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
| Amount of steel - - - - - lbs. | 100                               | 150                               | 200                               | 150                               | 150                               |
| Total weight - - - - - lbs.    | 420                               | 480                               | 520                               | 550                               | 600                               |
| Each - - - - -                 | \$61 00                           | 68 00                             | 76 00                             | 77 00                             | 79 00                             |

|                                |                                   |                                   |                                   |                                   |                                   |
|--------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size of hole - - - - - inches  | 10                                | 11 $\frac{5}{8}$                  | 13                                | 13                                | 13                                |
| Size of pin - - - - - inches   | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
| Amount of steel - - - - - lbs. | 200                               | 200                               | 200                               | 250                               | 300                               |
| Total weight - - - - - lbs.    | 650                               | 750                               | 800                               | 850                               | 900                               |
| Each - - - - -                 | \$86 00                           | 96 00                             | 104 00                            | 112 00                            | 120 00                            |

STAR OR DOUBLE REAMER—Fig. 1692

|                       |                                   |                                   |       |                                   |                                   |                                   |                                   |
|-----------------------|-----------------------------------|-----------------------------------|-------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size of hole - inches | 4 $\frac{1}{4}$                   | 4 $\frac{1}{2}$                   | 5     | 5 $\frac{5}{8}$                   | 6 $\frac{1}{4}$                   | 6 $\frac{5}{8}$                   | 7 $\frac{5}{8}$                   |
| Size of pin - inches  | 1 $\frac{5}{8}$ x 2 $\frac{1}{2}$ | 1 $\frac{5}{8}$ x 2 $\frac{1}{2}$ | 2 x 3 | 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
| Amount of steel, lbs. | 50                                | 50                                | 80    | 100                               | 100                               | 100                               | 100                               |
| Total weight - lbs.   | 160                               | 180                               | 220   | 280                               | 330                               | 350                               | 430                               |
| Each - - - - -        | \$48 50                           | 51 00                             | 58 00 | 65 00                             | 70 00                             | 73 00                             | 80 00                             |

|                           |                                   |                                   |                                   |                                   |                                   |                                   |
|---------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size of hole - - - inches | 8 $\frac{1}{4}$                   | 9 $\frac{5}{8}$                   | 10                                | 10                                | 12                                | 14                                |
| Size of pin - - - inches  | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
| Amount of steel - - lbs.  | 100                               | 150                               | 150                               | 300                               | 400                               | 500                               |
| Total weight - - lbs.     | 480                               | 580                               | 640                               | 800                               | 900                               | 1450                              |
| Each - - - - -            | \$85 00                           | 103 00                            | 106 00                            | 133 00                            | 177 00                            | 220 00                            |

When ordering, state size of pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.



## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## MACK'S IMPROVED AUSTRIAN UNDER REAMER

Patented March 4, 1902

FOR REAMING UNDER WELL CASING

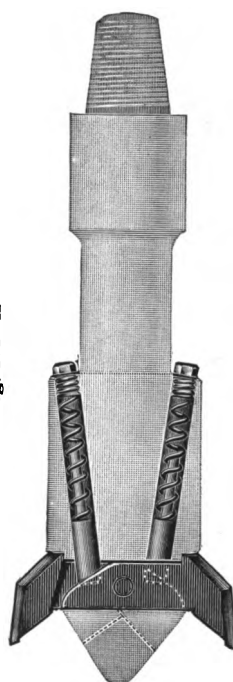
WITH BOX  
Fig. 1712

Showing bits or cutters in position for reaming

Fig. 1712-B

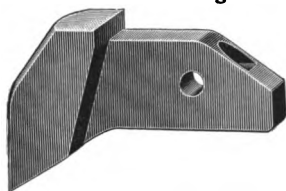


Showing bits or cutters in position for passing through pipe or casing

WITHOUT BOX  
Fig. 1712-A

Bottom hole reamer Showing construction and action

BIT OR CUTTER—Fig. 1712-E



Price includes two pair of cutters

| Size - - - - - inches                                           | 4%      | 5       | 5%      | 6%      | 6%      | 7%                | 8       | 9%              | 10      | 12      |
|-----------------------------------------------------------------|---------|---------|---------|---------|---------|-------------------|---------|-----------------|---------|---------|
| Under reamer complete, incl'ding lever, tongs, and wrench, each | 122 00  | 143 00  | 148 00  | 160 00  | 170 00  | 210 00            | 215 00  | 253 00          | 262 00  | 434 00  |
| Weight - - - - - lbs.                                           | 150     | 175     | 200     | 250     | 275     | 350               | 400     | 600             | 770     | 1,000   |
| Without box, Fig. 1712-A, each                                  | 110 00  | - - - - | 141 00  | 154 00  | - - - - | 200 00            | 205 00  | - - - -         | - - - - | - - - - |
| Weight - - - - - lbs.                                           | 125     | - - - - | 175     | 200     | - - - - | 325               | 350     | - - - -         | - - - - | - - - - |
| Extra cutters - - - - per pair                                  | 16 00   | - - - - | 21 50   | 24 00   | 26 00   | 34 50             | 35 00   | 40 00           | 42 00   | 54 00   |
| Weight - - - - - lbs.                                           | 8       | 10      | 12      | 15      | 25      | 35                | 35      | 45              | 50      | 100     |
| 7%-inch cutters for 5%-inch reamer                              | - - - - | - - - - | - - - - | - - - - | - - - - | per pair, \$35 50 | - - - - | Weight, 20 lbs. | - - - - | - - - - |
| 9%-inch cutters for 7%-inch reamer                              | - - - - | - - - - | - - - - | - - - - | - - - - | per pair, 41 00   | - - - - | Weight, 35 lbs. | - - - - | - - - - |
| 10%-inch cutters for 9%-inch reamer                             | - - - - | - - - - | - - - - | - - - - | - - - - | per pair, 42 00   | - - - - | Weight, 50 lbs. | - - - - | - - - - |
| 11%-inch cutters for 9%-inch reamer                             | - - - - | - - - - | - - - - | - - - - | - - - - | per pair, 44 50   | - - - - | Weight, 65 lbs. | - - - - | - - - - |
| 12 -inch cutters for 9%-inch reamer                             | - - - - | - - - - | - - - - | - - - - | - - - - | per pair, 49 00   | - - - - | Weight, 75 lbs. | - - - - | - - - - |

## PARTS OF UNDER REAMER

MANDREL—Fig. 1712-H



PIN—Fig. 1712-F



SPRING—Fig. 1712-G



| Size - - - - - inches      | 4%     | 5    | 5%   | 6%   | 6%   | 7%   | 8    | 9%   | 10   | 12   |
|----------------------------|--------|------|------|------|------|------|------|------|------|------|
| Mandrels - - - - each      | \$1 40 | 1 40 | 1 40 | 1 50 | 2 00 | 2 20 | 2 30 | 2 50 | 2 75 | 5 00 |
| Pins - - - - each          | 1 65   | 2 00 | 2 25 | 2 40 | 2 75 | 3 40 | 3 50 | 4 75 | 4 90 | 7 25 |
| Springs - - - - each       | 40     | 40   | 40   | 40   | 50   | 50   | 50   | 65   | 65   | 1 25 |
| Plugs (not illus.), - each | 1 65   | 1 70 | 1 75 | 1 90 | 2 00 | 2 40 | 2 40 | 2 80 | 2 80 | 3 75 |

For list of parts for adjusting cutters, see following page. When ordering, state size of box or pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

## WELL DRILLING TOOLS

## FOR CABLE SYSTEM

## MACK'S IMPROVED AUSTRIAN UNDER REAMER

Parts for adjusting bits or cutters

| Size                       | inches   | 4 $\frac{1}{4}$ | 5     | 5 $\frac{5}{8}$ | 6 $\frac{1}{4}$ | 6 $\frac{5}{8}$ |
|----------------------------|----------|-----------------|-------|-----------------|-----------------|-----------------|
| Levers (not illustrated)   | per pair | \$8 75          | 9 00  | 9 50            | 9 75            | 11 25           |
| Tongs (not illustrated)    | each     | 6 25            | 6 50  | 6 50            | 7 75            | 8 25            |
| Wrenches (not illustrated) | each     | 1 50            | 1 75  | 1 90            | 2 00            | 2 00            |
| Size                       | inches   | 7 $\frac{5}{8}$ | 8     | 9 $\frac{5}{8}$ | 10              | 12              |
| Levers (not illustrated)   | per pair | \$14 00         | 14 00 | 15 00           | 16 25           | 16 50           |
| Tongs (not illustrated)    | each     | 9 00            | 9 40  | 10 00           | 10 50           | 11 00           |
| Wrenches (not illustrated) | each     | 2 15            | 2 25  | 2 50            | 2 75            | 3 00            |

## OLD STYLE AUSTRIAN UNDER REAMER

(Superseded by Mack's patent, March 4, 1902)

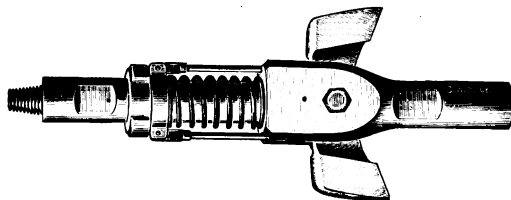
For each size of casing two pairs of knives are furnished

| Size of pin and box, inches | 1 $\frac{5}{8}$ x 2 $\frac{1}{2}$ | 2 x 3                             | 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
|-----------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| To ream under (casing)      | 4 $\frac{1}{4}$ only              | 4 $\frac{1}{4}$ & 5 $\frac{5}{8}$ | 5 only                            | 5 & 6 $\frac{1}{4}$               |
| Weight - lbs.               | 114                               | 125                               | 184                               | 200                               |
| Price -                     | \$119 00                          | 164 00                            | 143 00                            | 192 00                            |
| Size of pin and box, inches | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
| To ream under (casing)      | 6 $\frac{5}{8}$ & 8 $\frac{5}{8}$ | 7 $\frac{5}{8}$ only              | 7 $\frac{5}{8}$ & 9 $\frac{5}{8}$ | 8 $\frac{1}{4}$ only              |
| Weight - lbs.               | 385                               | 435                               | 475                               | 485                               |
| Price -                     | \$254 00                          | 228 00                            | 292 00                            | 248 00                            |

## PARTS OF OLD STYLE AUSTRIAN UNDER REAMER

| Size body for          | inches | 4 $\frac{1}{4}$ | 5     | 5 $\frac{5}{8}$ | 6 $\frac{1}{4}$ | 6 $\frac{5}{8}$ | 7 $\frac{5}{8}$ | 8 $\frac{1}{4}$ | 9 $\frac{5}{8}$ | 10    |
|------------------------|--------|-----------------|-------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------|
| Knives - per pair      |        | \$26 50         | 29 00 | 31 00           | 33 00           | 34 00           | 37 50           | 39 50           | 44 00           | 45 00 |
| Weight - lbs.          |        | 12              | 16    | 20              | 25              | 28              | 40              | 50              | 60              | 70    |
| Knife bolts - per pair |        | 6 50            | 6 50  | 6 50            | 6 50            | 6 50            | 8 00            | 8 00            | 8 00            | 8 00  |
| Backers - each         |        | 6 00            | 6 00  | 6 00            | 6 00            | 6 00            | 8 00            | 8 00            | 8 00            | 8 00  |
| Plungers - each        |        | 4 50            | 4 50  | 4 50            | 4 50            | 4 50            | 7 00            | 7 00            | 7 00            | 7 00  |

## RUSSIAN UNDER REAMER—Fig. 1707



Made to ream under 12 to 24 inch pipe.

Prices quoted upon application.

When ordering, state size of box or pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

## WELL DRILLING TOOLS

## FOR CABLE SYSTEM

**HOLLOW  
REAMER**

Fig. 1697



To straighten a crooked hole or to remove the sediment around tools when they are fast, the object being to make room enough for the fishing tool to take hold.

**CONICAL HEAD  
REAMER**

Fig. 1699



To ream out hole that has been drilled past lost tool.

**KEARNES HOLE  
STRAIGHTENING  
BIT—Fig. 1701**

To straighten a crooked hole or to cut off a projection.

**MCCLEARY PATENT  
ENLARGING BIT.**

Fig. 1709



The patent enlarging bit is a valuable tool in many formations. It drills ahead of the drive pipe or casing the ex-

act size of the outside of the shoe or the couplings, so that the pipe or casing can be forced down with little difficulty. The central bit drills in advance of the enlarging bit.

**WINGED  
SUBSTITUTE**

Fig. 1703



To keep stem perpendicular and guard against crooked hole in difficult formations. Used between stem and bit or reamer.

| Size of hole - inches   | 4 1/4         | 4 1/2         | 5         | 5 1/2         | 6             | 6 1/2         | 7 1/2         | 8 1/4         | 9 1/2         | 10            |
|-------------------------|---------------|---------------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Size of pin - inches    | 1 5/8 x 2 1/2 | 1 5/8 x 2 1/2 | 2 x 3     | 2 1/4 x 3 1/4 | 2 3/4 x 3 1/2 | 2 3/4 x 3 1/2 | 2 3/4 x 3 1/2 | 2 3/4 x 3 1/2 | 2 3/4 x 3 1/2 | 2 3/4 x 3 1/2 |
| Hollow reamer           | \$54 00       | 57 00         | 64 00     | 72 00         | 80 00         | 85 00         | 98 00         | 107 00        | 125 00        | 130 00        |
| Weight                  | 120           | 150           | 230       | 350           | 420           | 450           | 480           | 510           | 560           | 600           |
| Conical head reamer     | ---           | ---           | 60 00     | 63 00         | 66 00         | ---           | ---           | ---           | ---           | ---           |
| Amount steel            | ---           | ---           | 100       | 100           | 100           | ---           | ---           | ---           | ---           | ---           |
| Total weight            | ---           | ---           | 200       | 260           | 350           | ---           | ---           | ---           | ---           | ---           |
| Kearnes bit, fig. 1701  | \$29 00       | 33 00         | 39 00     | 42 00         | 50 00         | 56 00         | 60 00         | 63 00         | 75 00         | 77 00         |
| Amount steel            | 60            | 80            | 100       | 100           | 100           | 120           | 120           | 120           | 150           | 150           |
| Total weight            | 125           | 135           | 150       | 160           | 225           | 250           | 310           | 380           | 400           | 410           |
| McCleary bit, fig. 1709 | \$38 00       | 41 00         | 48 00     | 56 00         | 65 00         | 70 00         | 83 00         | 92 00         | 110 00        | 116 00        |
| Weight                  | 125           | 135           | 160       | 185           | 230           | 300           | 350           | .00           | 480           | 500           |
| Winged substitute       | Prices        | on spec       | ification | ---           | ---           | ---           | ---           | ---           | ---           | ---           |
| Weight                  | ---           | ---           | 200       | 250           | 300           | 350           | 450           | 500           | ---           | ---           |

**MACK PATENT HOLE STRAIGHTENER**

Put on auger stem at intervals to keep bit in a straight line. Used when the hole varies from a vertical line.

|                                                        |       |   |   |   |   |   |   |   |         |
|--------------------------------------------------------|-------|---|---|---|---|---|---|---|---------|
| Size hole for, 8 inches; size stem for, 4 1/2 inches.  | Price | - | - | - | - | - | - | - | \$50 00 |
| Size hole for, 10 inches; size stem for, 4 1/2 inches. | Price | - | - | - | - | - | - | - | 70 00   |
| Size hole for, 13 inches; size stem for, 4 1/2 inches. | Price | - | - | - | - | - | - | - | 102 00  |
| Size hole for, 13 inches; size stem for, 5 inches.     | Price | - | - | - | - | - | - | - | 102 00  |

For illustrations, see following page.

When ordering, state size of box or pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

WELL DRILLING TOOLS

FOR CABLE SYSTEM

MACK PATENT HOLE STRAIGHTENER

COMPLETE

SECTIONAL

SECTIONAL TOP

TONGS

Fig. 1719



VIEW OF  
SLIPS

Fig. 1721



Fig. 1725

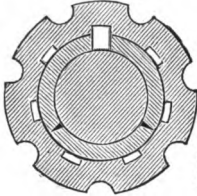


Fig. 1727



Tongs, fig. 1727, are for holding the slips while the collar is being screwed on. For list, see preceding page.

FISHING JARS

From 12 to 36 inch stroke

Fig. 1790



Patented April 24, 1900.

| Diam-eter, inches | Size hole, inches | Length stroke, inches | Box and pin, inches | Weight, lbs. | Each    | Diam-eter, inches | Size hole, inches | Length stroke, inches | Box and pin, inches | Weight, lbs. | Each    |
|-------------------|-------------------|-----------------------|---------------------|--------------|---------|-------------------|-------------------|-----------------------|---------------------|--------------|---------|
| 3 1/2             | 4 1/4             | 8                     | 1 3/4 x 2 1/2       | 110          | \$62 00 | 5 1/2             | 6 1/2 or larger   | 12                    | 2 1/4 x 3 3/4       | 350          | \$95 00 |
| 3 3/4             |                   | 10                    |                     | 115          | 64 00   | 5 1/2             |                   | 14                    |                     | 360          | 97 00   |
| 3 1/2             |                   | 12                    |                     | 120          | 65 00   | 5 1/2             |                   | 16                    |                     | 370          | 100 00  |
| 3 1/4             |                   | 14                    |                     | 125          | 67 00   | 5 1/2             |                   | 18                    |                     | 380          | 102 00  |
| 3 1/4             |                   | 16                    |                     | 130          | 68 00   | 5 1/2             |                   | 20                    |                     | 390          | 105 00  |
| 3 1/4             |                   | 18                    |                     | 135          | 69 00   | 5 1/2             |                   | 22                    |                     | 400          | 107 00  |
| 3 1/4             |                   | 20                    |                     | 140          | 65 00   | 5 1/2             |                   | 24                    |                     | 410          | 109 00  |
| 3 1/4             |                   | 22                    |                     | 150          | 66 00   | 5 1/2             |                   | 26                    |                     | 420          | 117 00  |
| 3 1/4             |                   | 24                    |                     | 160          | 68 00   | 5 1/2             |                   | 28                    |                     | 430          | 124 00  |
| 3 1/4             |                   | 26                    |                     | 170          | 70 00   | 5 1/2             |                   | 30                    |                     | 470          | 108 00  |
| 3 1/4             | 4 1/2             | 8                     | 2 x 3               | 180          | 71 00   | 6 1/4             | 7 1/2 or larger   | 8                     | 2 1/4 x 3 3/4       | 500          | 111 00  |
| 3 1/4             |                   | 10                    |                     | 190          | 75 00   | 6 1/4             |                   | 10                    |                     | 530          | 114 00  |
| 3 1/4             |                   | 12                    |                     | 210          | 74 00   | 6 1/4             |                   | 12                    |                     | 560          | 116 00  |
| 3 1/4             |                   | 14                    |                     | 215          | 75 00   | 6 1/4             |                   | 14                    |                     | 590          | 119 00  |
| 3 1/4             |                   | 16                    |                     | 220          | 77 00   | 6 1/4             |                   | 16                    |                     | 620          | 122 00  |
| 3 1/4             |                   | 18                    |                     | 225          | 79 00   | 6 1/4             |                   | 18                    |                     | 650          | 125 00  |
| 3 1/4             |                   | 20                    |                     | 230          | 81 00   | 6 1/4             |                   | 20                    |                     | 680          | 128 00  |
| 3 1/4             |                   | 22                    |                     | 240          | 83 00   | 6 1/4             |                   | 22                    |                     | 710          | 130 00  |
| 3 1/4             |                   | 24                    |                     | 250          | 84 00   | 6 1/2             |                   | 24                    |                     | 500          | 115 00  |
| 3 1/4             |                   | 26                    |                     | 260          | 86 00   | 6 1/2             |                   | 26                    |                     | 530          | 118 00  |
| 3 1/4             | 5                 | 8                     | 2 1/4 x 3 3/4       | 270          | 88 00   | 6 1/2             | 8 1/4 or larger   | 8                     |                     | 560          | 121 00  |
| 3 1/4             |                   | 10                    |                     | 280          | 93 00   | 6 1/2             |                   | 10                    |                     | 590          | 124 00  |
| 3 1/4             |                   | 12                    |                     | 290          | 99 00   | 6 1/2             |                   | 12                    |                     | 620          | 127 00  |
| 3 1/4             |                   | 14                    |                     | 300          | 84 00   | 6 1/2             |                   | 14                    |                     | 650          | 130 00  |
| 3 1/4             |                   | 16                    |                     | 310          | 86 00   | 6 1/2             |                   | 16                    |                     | 680          | 133 00  |
| 3 1/4             |                   | 18                    |                     | 320          | 89 00   | 6 1/2             |                   | 18                    |                     | 710          | 136 00  |
| 3 1/4             |                   | 20                    |                     | 330          | 91 00   | 6 1/2             |                   | 20                    |                     | 740          | 139 00  |
| 3 1/4             |                   | 22                    |                     | 340          | 93 00   | 7                 |                   | 22                    |                     | 620          | 128 00  |
| 3 1/4             |                   | 24                    |                     | 350          | 95 00   | 7                 |                   | 24                    |                     | 640          | 132 00  |
| 3 1/4             |                   | 26                    |                     | 360          | 97 00   | 7                 |                   | 26                    |                     | 660          | 135 00  |
| 3 1/4             | 5 1/2 or larger   | 8                     | 2 3/4 x 3 3/4       | 370          | 100 00  | 7                 | 8 1/4 or larger   | 8                     |                     | 680          | 139 00  |
| 3 1/4             |                   | 10                    |                     | 380          | 102 00  | 7                 |                   | 10                    |                     | 700          | 142 00  |
| 3 1/4             |                   | 12                    |                     | 390          | 108 00  | 7                 |                   | 12                    |                     | 720          | 145 00  |
| 3 1/4             |                   | 14                    |                     | 400          | 115 00  | 7                 |                   | 14                    |                     | 740          | 149 00  |
| 3 1/4             |                   | 16                    |                     | 330          | 90 00   | 7                 |                   | 16                    |                     | 760          | 152 00  |
| 3 1/4             |                   | 18                    |                     | 340          | 93 00   | 7                 |                   | 18                    |                     | 780          | 156 00  |
| 3 1/4             |                   | 20                    |                     |              |         | 7                 |                   | 20                    |                     |              |         |
| 3 1/4             |                   | 22                    |                     |              |         | 7                 |                   | 22                    |                     |              |         |
| 3 1/4             |                   | 24                    |                     |              |         | 7                 |                   | 24                    |                     |              |         |
| 3 1/4             |                   | 26                    |                     |              |         | 7                 |                   |                       |                     |              |         |

When ordering, state size of box and pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

## WELL DRILLING TOOLS

## FOR CABLE SYSTEM

## FISHING TOOLS

## HORN SOCKETS

Fig. 1750

Fig. 1752



Without bowl      With bowl

To take friction hold of a loose tool in the well.

By putting on the bowl the socket can be used in a larger hole.

## SLIP SOCKETS

Two sets of slips with each socket

Fig. 1786

Fig. 1788



Without bowl      With bowl

When ordering, state size of tool the slips are to catch.

## SQUARE SOCKET

Fig. 1789



For catching square of tool that has broken off below collar.

Prices on application



| Size of hole - - - - - inches                                | 4 1/4         | 4 1/2         | 5     | 5 1/8 | 5 3/8         | 6 1/4         | 6 3/8         | 7 1/8         | 8 1/4         | 9 1/8         | 10            |
|--------------------------------------------------------------|---------------|---------------|-------|-------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Size of pin - - - - - inches                                 | 1 1/2 x 2 1/2 | 1 1/2 x 2 1/2 | 2 x 3 | 2 x 3 | 2 1/2 x 3 1/2 | 2 1/2 x 3 1/2 | 2 1/2 x 3 1/2 | 2 1/2 x 3 1/2 | 2 1/2 x 3 1/2 | 2 1/2 x 3 1/2 | 2 1/2 x 3 1/2 |
| Horn sockets, fig. 1750 - - -                                | \$14 50       | 16 00         | 18 50 | 21 00 | 21 50         | 25 00         | 27 00         | 31 00         | 33 00         | 38 00         | 39 50         |
| Weight - - - - - lbs.                                        | 90            | 100           | 110   | 118   | 125           | 140           | 150           | 155           | 160           | 180           | 190           |
| Fig. 1752, with bowl for hole, inches                        | 5 1/2         | 5 3/4         | 6 1/4 | 6 3/8 | 7 1/8         | 8 1/4         | 8 3/8         | 9 1/8         | 10            | 11 1/8        | 12            |
| Price - - - - -                                              | 19 50         | 21 00         | 24 50 | 27 00 | 30 50         | 35 00         | 39 00         | 43 50         | 47 50         | 56 00         | 60 00         |
| Weight - - - - - lbs.                                        | 100           | 110           | 125   | 130   | 140           | 160           | 170           | 180           | 185           | 210           | 230           |
| Slip sockets, regular, fig. 1786 -                           | \$51 00       | 53 00         | 58 00 | 60 00 | 64 00         | 70 00         | 75 00         | 88 00         | 93 00         | 118 00        | 124 00        |
| Weight - - - - - lbs.                                        | 100           | 110           | 130   | 140   | 150           | 200           | 230           | 300           | 350           | 400           | 450           |
| Slip sockets, ex. hy. with long reins                        | - - -         | - - -         | - - - | - - - | - - -         | 100 00        | 107 00        | 128 00        | 140 00        | 168 00        | 176 00        |
| Weight - - - - - lbs.                                        | - - -         | - - -         | - - - | - - - | - - -         | 250           | 280           | 380           | 420           | 500           | 550           |
| Slip socket slips only - - - per pair                        | \$8 50        | 8 50          | 8 50  | 8 50  | 8 50          | 8 50          | 8 50          | 10 50         | 10 50         | 10 50         | 10 50         |
| Slip socket cross bars - - -                                 | 2 00          | 2 00          | 2 00  | 2 00  | 2 00          | 2 00          | 2 00          | 2 50          | 2 50          | 2 50          | 2 50          |
| Slip sockets with bowl, fig. 1788, for hole - - - - - inches | 5 1/2         | 5 3/4         | 6 1/4 | 6 3/8 | 7 1/8         | 8 1/4         | 8 3/8         | 9 1/8         | 10            | 11 1/8        | 13            |
| Price - - - - -                                              | \$63 00       | 65 00         | 72 00 | 76 00 | 81 00         | 89 00         | 98 00         | 110 00        | 120 00        | 146 00        | 156 00        |
| Weight - - - - - lbs.                                        | 110           | 120           | 145   | 170   | 230           | 260           | 340           | 400           | 500           | 520           | 600           |
| Square sockets, fig. 1789 - - -                              | - - -         | - - -         | - - - | - - - | - - -         | - - -         | - - -         | - - -         | - - -         | - - -         | - - -         |
| Weight - - - - - lbs.                                        | 100           | 110           | 120   | 150   | 200           | 230           | 300           | 350           | 400           | 450           | - - -         |

When ordering, state size of pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

## WELL DRILLING TOOLS

FOR CABLE SYSTEM  
FISHING TOOLS

SIDE SLOT COMBINATION SOCKET

Fig. 1760

To take hold of pin or neck  
of rope socket.Working parts adjusted  
through the slots.BOWL SPEAR  
BULL DOG PATTERN  
Fig. 1796For taking inside hold of  
bowl or any hollow tool.CASING  
BOWL

Fig. 1797



FRICTION SOCKET. Fig. 1754



To take hold of tools that are loose in well.

SIDE SLOT COMBINATION SOCKETS—Fig. 1760

|              |        |                                   |                                   |                                   |                                   |                                   |
|--------------|--------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size of hole | inches | 4 $\frac{1}{4}$                   | 4 $\frac{1}{2}$                   | 5                                 | 5 $\frac{3}{16}$                  | 5 $\frac{1}{2}$                   |
| Size of pin  | inches | 1 $\frac{1}{8}$ x 2 $\frac{1}{2}$ | 1 $\frac{1}{8}$ x 2 $\frac{1}{2}$ | 2 x 3                             | 2 x 3                             | 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ |
| Weight       | lbs.   | 70                                | 75                                | 100                               | 110                               | 125                               |
| Price        |        | \$42 50                           | 47 00                             | 52 00                             | 54 00                             | 58 00                             |
| Size of hole | inches | 6 $\frac{1}{4}$                   | 6 $\frac{3}{8}$                   | 7 $\frac{1}{8}$                   | 8 $\frac{1}{4}$                   | 9 $\frac{1}{8}$                   |
| Size of pin  | inches | 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ |
| Weight       | lbs.   | 175                               | 175                               | 250                               | 260                               | 300                               |
| Price        |        | \$64 00                           | 68 00                             | 77 00                             | 83 00                             | 104 00                            |
| Slips        |        | per set, \$8 00                   |                                   |                                   |                                   |                                   |

BOWL SPEAR—BULL DOG PATTERN—Fig. 1796

Weight, 75 lbs. - - - - - \$36 50

CASING BOWLS, Fig. 1797

With two pairs of slips.

|        |          |                 |                 |                 |                 |        |
|--------|----------|-----------------|-----------------|-----------------|-----------------|--------|
| Size   | inches   | 5 $\frac{1}{8}$ | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 8 $\frac{1}{4}$ | 10     |
| Weight | lbs      |                 |                 | 80              | 165             |        |
| Price  |          | \$70 00         | 80 00           | 80 00           | 95 00           | 125 00 |
| Slips  | per pair | 22 50           | 30 00           | 30 00           | 32 50           | 37 50  |

FRICTION SOCKETS, Fig. 1754

|              |        |         |                                   |                                   |                                   |
|--------------|--------|---------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size of hole | inches | 5       | 5 $\frac{1}{8}$                   | 6 $\frac{1}{4}$                   | 6 $\frac{3}{8}$                   |
| Size of pin  | inches | 2 x 3   | 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ |
| Fig. 1754    |        | \$17 00 | 19 50                             | 22 00                             | 23 00                             |
| Weight       | lbs.   | 120     | 140                               | 160                               | 170                               |

When ordering, state size of pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

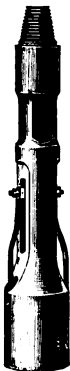
WELL DRILLING TOOLS

FOR CABLE SYSTEM  
FISHING TOOLS

COLLAR GRAB  
Fig. 1806



COLLAR SOCKET  
Fig. 1766



The collar grab is to take hold of any loose tool just below the collar, when the pin is broken off.

The collar socket is to take hold of the collar of a tool.  
6¼-INCH COLLAR GRAB, fig. 1806 - - - \$76 50  
Weight, 350 pounds.

COLLAR SOCKETS, Fig. 1766

| Size of hole - inches | 6¼      | 6½      | 7½      | 8¼      | 9½      |
|-----------------------|---------|---------|---------|---------|---------|
| Size of pin - inches  | 2¼ x 3¼ | 2¼ x 3¼ | 2¼ x 3¼ | 2¼ x 3¼ | 2¼ x 3¼ |
| Price - - - -         | \$60 00 | 65 00   | 94 00   | 103 00  | 117 00  |
| Weight - - lbs.       | 150     | 160     | 190     | 200     | 250     |
| Extra slips. per pair | 8 50    | 8 50    | 11 00   | 11 00   | 11 00   |

Fig. 1770



DRIVE DOWN SOCKET

To reduce the battered neck of a rope socket so a combination socket can go over it.

| Size of hole - - inches | 4¼      | 4½      | 5     | 5½      | 6¼      | 7½      | 8¼      | - -     |
|-------------------------|---------|---------|-------|---------|---------|---------|---------|---------|
| Size of pin - - inches  | 1½ x 2½ | 1½ x 2½ | 2 x 3 | 2¼ x 3¼ | 2¼ x 3¼ | 2¼ x 3¼ | 2¼ x 3¼ | 2¼ x 3¼ |
| Weight - - - lbs.       | - - -   | - - -   | - - - | 125     | 150     | - - -   | - - -   | - - -   |
| Price - - - -           | - - -   | - - -   | - - - | \$24 00 | 26 50   | - - -   | - - -   | - - -   |

Fig. 1775



SIDE JAR SOCKETS

To catch one rein of broken jars.  
When ordering, state width and thickness of rein.

| Size of hole, inches             | 4¼      | 4½      | 5     | 5½      | 6¼      | 6½      | 7½      | 8¼      |
|----------------------------------|---------|---------|-------|---------|---------|---------|---------|---------|
| Size of pin, inches              | 1½ x 2½ | 1½ x 2½ | 2 x 3 | 2¼ x 3¼ | 2¼ x 3¼ | 2¼ x 3¼ | 2¼ x 3¼ | 2¼ x 3¼ |
| Price - - - -                    | \$44 50 | 46 00   | 50 00 | 55 00   | 60 00   | 62 50   | 70 00   | 75 00   |
| Weight - - lbs.                  | 100     | 120     | 130   | 150     | 175     | 175     | 200     | 250     |
| Slips - - - - - per pair, \$8 50 |         |         |       |         |         |         |         |         |

When ordering, state size of pin, style of taper, number of threads to inch (flat or sharp) size of wrench square; also diameter of hole in which tool is to be used.

Fig. 1779





CENTER  
JAR  
SOCKET

Fig. 1777



To catch both reins of broken jars.

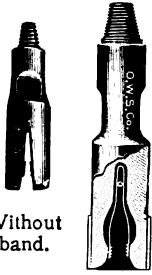
WELL DRILLING TOOLS  
FOR CABLE SYSTEM  
FISHING TOOLS

|                       |         |         |         |         |
|-----------------------|---------|---------|---------|---------|
| Size of hole, inches  | 4½      | 4½      | 5       | 5½      |
| Size of pin, inches   | 1½ x 2½ | 1½ x 2½ | 2 x 3   | 2½ x 3½ |
| Center jar, fig. 1777 | \$41 00 | 43 00   | 47 50   | 53 00   |
| Weight - - lbs.       | 80      | 90      | 110     | 120     |
| Jar tongue, fig. 1781 | \$48 00 | 50 00   | 54 00   | 60 00   |
| Weight - - lbs.       | 40      | 50      | 60      | 80      |
| Jar tongue, fig. 1784 | \$50 00 | 52 00   | 56 00   | 62 00   |
| Weight - - lbs.       | 50      | 60      | 75      | 90      |
| Size of hole, inches  | 6½      | 6½      | 7½      | 8½      |
| Size of pin, inches   | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ |
| Center jar, fig. 1777 | \$58 00 | 61 00   | 69 50   | 75 00   |
| Weight - - lbs.       | 150     | 170     | 190     | 210     |
| Jar tongue, fig. 1781 | \$65 00 | 68 00   | 79 00   | 85 00   |
| Weight - - lbs.       | 100     | 110     | 140     | 160     |
| Jar tongue, fig. 1784 | \$67 00 | 70 00   | 81 00   | 87 00   |
| Weight - - lbs.       | 110     | 120     | 150     | 170     |

Slips for figs. 1781-1784, per pair - - - - - \$8 50  
When ordering, state width and thickness of reins.

JAR TONGUE  
SOCKETS

Fig. 1781 Fig. 1784



Without band.

With band.

To catch the tongue or fish tail of jars.

JAR KNOCKER OR BUMPER—Fig. 1851



Jar knockers are to knock jars loose when locked, or loosening tools that are stuck in the hole.

BALL BEARING JAR KNOCKER OR BUMPER—Fig. 1852



|                    |       |       |       |       |       |
|--------------------|-------|-------|-------|-------|-------|
| Length - - feet    | 12    | 14    | 16    | 18    | 20    |
| Fig. 1851 - - -    | 28 00 | 31 50 | 35 00 | 38 50 | 42 00 |
| Fig. 1852, B. B. - | 35 00 | 38 50 | 42 00 | 45 50 | 49 00 |
| Weight - - lbs.    | 220   | 245   | 270   | 295   | 320   |

SIDE LATCH JACK—Fig. 1811



BOOT JACK—Fig. 1812



Side latch jacks and boot jacks are to take hold of broken jars, also used as baller grabs.

Side latch jacks - - \$24 00 Weight, 100 lbs.  
Boot jacks - - - 24 00 Weight, 110 lbs.

ALLIGATOR GRAB—Fig. 1810



To grip fragment of steel or other small articles lost or dropped in well.

ALLIGATOR GRABS

|               |         |       |       |       |       |       |       |       |
|---------------|---------|-------|-------|-------|-------|-------|-------|-------|
| Size - inches | 4½      | 4½    | 5     | 5½    | 6½    | 6½    | 7½    | 8½    |
| Price - - -   | \$52 00 | 54 00 | 56 00 | 60 00 | 64 00 | 66 00 | 72 00 | 75 00 |
| Weight, lbs.  | 120     | 130   | 140   | 170   | 200   | 220   | 240   | 260   |

When ordering, state size of pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which tool is to be used.

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## FISHING TOOLS

Tools for cutting cable or rope in well

HORSE SHOE  
TRIP KNIFE

Fig. 1828



For cutting off cable close to the rope socket, will not cut until the trip strikes rope socket barrel, allowing the knife to fall. We recommend this as being the best rope knife.

Weight, 20 lbs.

HOOK ROPE  
KNIFE

Fig. 1839



Weight, 15 lbs.

V ROPE  
KNIFE

Fig. 1844



Weight, 15 lbs.

VALVE ROPE  
KNIFE

Fig. 1837



Weight, 20 lbs.

ROPE  
KNIFE  
SINKER

Fig. 1831



The sand line is tied in the eye; jars and rope knife screwed to the lower end.

Weight, 20 lbs.

## KNIVES FOR CUTTING WIRE ROPE

## MAPE'S PATENT

Fig. 1579



Wt., 40 lbs.

O. W. S. CO.  
Fig. 1578

Wt., 20 lbs.

SUCKER  
ROD  
JARS

Fig. 1833



To attach to rope knife to cut rope in well, used on a string of sucker rods.

Wt., 20 lbs.

PIPE OR  
SWIVEL  
JARS

Fig. 1835



Figs. 1835 and 1845 are used with a rope knife to prevent the rope from twisting or kinking.

Wt., 20 lbs.

BALL BEARING  
SWIVEL FOR  
ROPE KNIFE

Fig. 1845



Wt., 10 lbs.

Horse shoe trip rope knife, fig. 1828 \$22 50  
Hook rope knife, fig. 1839 - - - 7 00  
V rope knife, fig. 1844 - - - 9 25  
Valve rope knife, fig. 1837 - - - 14 50  
Mape's wire rope knife, fig. 1579 - 75 00

O. W. S. Co., wire rope knife, fig. 1578 \$16 50  
Sucker rod jars, fig. 1833 - - - 10 00  
Swivel jars, fig. 1835 - - - 6 50  
B. B. swivel jars, fig. 1845 - - - 7 00  
Rope knife sinker, fig. 1831 - - - 4 50



**REGULAR**  
Fig. 1914**WELL DRILLING TOOLS**

FOR CABLE SYSTEM

FISHING TOOLS

PIPE SWEDGES

For opening a clear passage through collapsed pipe or casing

|                       |                                   |                                   |       |                                   |                                   |                                   |
|-----------------------|-----------------------------------|-----------------------------------|-------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size of hole - inches | 4 $\frac{1}{4}$                   | 4 $\frac{1}{2}$                   | 5     | 5 $\frac{1}{2}$                   | 6 $\frac{1}{4}$                   | 6 $\frac{3}{4}$                   |
| Size of pin - inches  | 1 $\frac{1}{2}$ x 2 $\frac{1}{2}$ | 1 $\frac{1}{2}$ x 2 $\frac{1}{2}$ | 2 x 3 | 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
| Price - - - - -       | \$18 00                           | 20 00                             | 23 00 | 27 00                             | 31 00                             | 34 00                             |
| Weight - - - lbs.     | 70                                | 80                                | 110   | 150                               | 190                               | 210                               |

|                       |                                   |                                   |                                   |                                   |                                   |                                   |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Size of hole - inches | 7 $\frac{1}{8}$                   | 8 $\frac{1}{4}$                   | 9 $\frac{1}{8}$                   | 10                                | 11 $\frac{1}{8}$                  | 12 $\frac{1}{2}$                  |
| Size of pin - inches  | 2 $\frac{1}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ | 2 $\frac{3}{4}$ x 3 $\frac{3}{4}$ |
| Price - - - - -       | \$40 00                           | 44 00                             | 52 00                             | 55 00                             | 65 00                             | 76 00                             |
| Weight - - - lbs.     | 250                               | 290                               | 365                               | 400                               | 550                               | 650                               |

**FLUTED**  
Fig. 1918**TWIST DRILL**

Fig. 1881



When the top of a lost tool has been battered so large that there is not room for a fishing tool to take hold, this tool drills a hole in the top of lost tool, in which hole is inserted the twist drill spear (fig. 1879).

Used on tubing.

Price - - - - - \$35 00

Weight, 30 lbs.

**TWIST DRILL SPEAR**

Fig. 1879



To catch a lost tool in the hole made by the twist drill (fig. 1881).  
Used on drilling tools.

Price - - - - - \$29 00

Weight, 50 lbs.

**SAND PUMP  
OR BAILER  
GRAB**

Fig. 1808

For taking hold of sand pump or bailer when lost in the well.

**ROPE SOCKET SPEAR**

Fig. 1814

**ROPE SOCKET DRILL**

Fig. 1816



To drill rope out of rope socket neck.

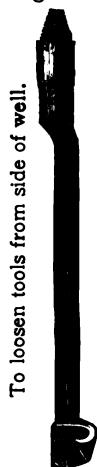
Price - - - - - \$35 00

|                                               |         |                 |                 |
|-----------------------------------------------|---------|-----------------|-----------------|
| Size hole for - - - - - inches                | 5       | 5 $\frac{1}{2}$ | 6 $\frac{1}{4}$ |
| Sand pump or bailer grab, fig. 1808 - - - - - | \$28 00 | 31 00           | 34 00           |
| Weight - - - - - lbs.                         | 130     | 150             | 180             |
| Rope socket spear, fig. 1814 - - - - -        | \$44 00 | 50 00           | 55 00           |
| Weight - - - - - lbs.                         | 100     | 125             | 150             |

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## FISHING TOOLS

BIT HOOK  
Fig. 1792

To loosen tools from side of well.

SPUD  
Fig. 1798

For spudding around and loosening a bit or reamer when fast in the well, if disconnected from the rest of the tools. Length of blade, 8 feet. Longer spuds to order.

WHIP STOCK  
Fig. 1803Used in drilling past a "string" of lost tools. There is a hole in the bottom of the whip stock which goes over the end of the rope socket or pin. The whip stock guides the tools used in drilling past into the side of the well. Length, 10 feet.  
Prices on application.WHIP  
STOCK GRAB  
Fig. 1804

For removing whip stock from well.

Weight, 200 pounds.

Price - \$43 00

SPEAR  
Fig. 1800

For spudding around and loosening the whole or a part of a string of tools when fast in the well. Lengths, 40 to 60 feet.

BIT HOOKS—Fig. 1792

| Size of hole - - inches | 5       | 5½                | 6¼      | 6½      | 7½      | 8¼      | 9½      | 10      | 12      | 13      |
|-------------------------|---------|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Size of pin - - inches  | 2 x 3   | 2½ x 3 or 2½ x 3¾ | 2¾ x 3¾ | 2¾ x 3¾ | 2¾ x 3¾ | 2¾ x 3¾ | 2¾ x 3¾ | 2¾ x 3¾ | 2¾ x 3¾ | 2¾ x 3¾ |
| Price - - - - -         | \$27 00 | 30 00             | 32 00   | 34 00   | 38 00   | 41 00   | 46 00   | 48 00   | 58 00   | 60 00   |
| Weight - - - - lbs.     | 125     | 150               | 180     | 200     | 250     | 290     | 350     | 360     | 400     | 450     |

SPUDS AND WHIP STOCKS

| Size of hole - - - inches | 4¼      | 4½    | 5     | 5½    | 6¼    | 6½    | 7½    | 8¼    | 9½    | 10    | 11½   | 12    |
|---------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Spuds - - - - -           | \$33 00 | 35 00 | 39 00 | 45 00 | 50 00 | 53 00 | 61 00 | 67 00 | 78 00 | 82 00 | 95 00 | 99 00 |
| Weight - - - - lbs.       | 190     | 210   | 230   | 250   | 280   | 290   | 320   | 350   | 420   | 500   | 700   | 800   |

SPEARS—Fig. 1800

| Length - - - - - feet                    | 40       | 50     | 60     |
|------------------------------------------|----------|--------|--------|
| For 5½-inch hole, ¾ inch thick - - - - - | \$160 00 | 180 00 | 200 00 |
| Weight - - - - - lbs.                    | 575      | 715    | 850    |
| For 6¼-inch hole, ¾ inch thick - - - - - | \$175 00 | 195 00 | 215 00 |
| Weight - - - - - lbs.                    | 650      | 800    | 950    |

Spears are f.o.b. cars at Pittsburgh, Pa.

When ordering, state size of pin, style of taper, number of threads to inch (flat or sharp), size of wrench square, also diameter of hole in which tool is to be used.

## WELL DRILLING TOOLS

Fig. 1853



FOR CABLE SYSTEM

## MILLING TOOLS

When a pin is broken from a tool in the well it is sometimes desirable to cut a new pin to aid in its removal. The milling tools shown herewith are designed for that purpose. Figs. 1853 and 1855 are made to fit 2-inch tubing. Fig. 1855 is the latest design. The milling wheel, fig. 1992, is attached to the 2-inch tubing above the well mouth and a rope transmission, carried from the milling wheel to the bull wheel, provides the motive power necessary for cutting the pin. The milling jack holds the tubing in position and regulates the feed.

Fig. 1855



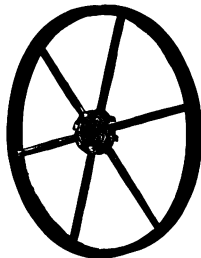
Solid

| Size of hole, inches | 4¼      | 4½    | 5       | 5½    | 5¾    | 6¼    | 6½    | 7½    | 8¼    |
|----------------------|---------|-------|---------|-------|-------|-------|-------|-------|-------|
| Fig. 1853 - - -      | -----   | ----- | \$55 00 | 57 00 | 59 00 | 63 00 | 66 00 | 93 00 | ----- |
| Weight, - - lbs.     | -----   | ----- | 20      | 22    | 25    | 35    | 40    | 50    | ----- |
| Fig. 1855 - - -      | \$27 00 | 30 00 | 34 00   | 36 00 | 40 00 | 45 00 | 48 00 | 58 00 | 63 00 |
| Weight, - - lbs.     | 20      | 20    | 23      | 28    | 45    | 58    | 60    | 80    | 85    |

SIDE  
RASP  
Fig. 1873

## MILLING WHEEL

Fig. 1992

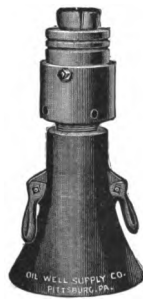


Weight, 50 lbs.

Price - - - - - \$35 00

## MILLING JACK AND WRENCH

Fig. 1993



Weight, 390 lbs.

Price - - - - - \$135 00

Fig. 1993A

TWO-  
WING  
RASP

Fig. 1874



A "milling job" has been regarded as one of the most difficult known to the trade, requiring unusual skill and caution. With the milling jack the time consumed is reduced from an average of two days to frequently less than two hours. The jack regulates the feed and sustains the weight of the tubing. It has ball bearings and can be operated with ease and accuracy.

## RASPS

Figs. 1873-1874

For rasping off or reducing collars on lost tools, so that a fishing tool can take hold

| Size of hole, in. | 4¼      | 4½      | 5     | 5½      | 6¼      | 6½      | 7½      | 8¼      |
|-------------------|---------|---------|-------|---------|---------|---------|---------|---------|
| Size of pin - in. | 1½ x 2½ | 1½ x 2½ | 2 x 3 | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ |
| Side rasps - -    | \$35 50 | 37 00   | 41 00 | 45 00   | 50 00   | 53 00   | 60 00   | 65 00   |
| Weight - lbs.     | 190     | 210     | 230   | 250     | 280     | 290     | 320     | 350     |
| Two-wing rasps    | \$62 00 | 65 00   | 71 00 | 78 00   | 85 00   | 89 00   | 101 00  | 108 00  |
| Weight - lbs.     | 150     | 180     | 230   | 350     | 420     | 450     | 480     | 510     |

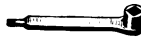
# TOOLS FOR REMOVING CASING FROM WELL

## MACK'S PATENT TRIP CASING SPEAR—Fig. 1857



### WRENCH FOR MACK'S PATENT SPEAR

Fig. 1858



Price - - - - - \$1 75

### SET FOR MACK'S PATENT SPEAR

Fig. 1859



Price - - - - - \$1 00

If the casing cannot be pulled after taking hold with the trip spear, the spear can be released by jarring down.

## FOX TRIP CASING SPEAR Fig. 1861



## BULL DOG CASING SPEAR Fig. 1863-4



The Bull Dog spear will take a strong hold, but will not let go.

|                                          |          |          |          |        |        |         |         |
|------------------------------------------|----------|----------|----------|--------|--------|---------|---------|
| Size of casing - - - - - inches          | 3½       | 4½       | 4½       | 5      | 5 ¾    | 5 ¾     | 6½      |
| Size of pin - - - - - inches             | 1 ¾ x 2  | 1 ¾ x 2½ | 1 ¾ x 2½ | 2 x 3  | 2 x 3  | 2½ x 3½ | 2½ x 3½ |
| Mack's spear, fig. 1857 - - - - -        | \$128 00 | 142 00   | 150 00   | 165 00 | 170 00 | 178 00  | 200 00  |
| Weight - - - - - lbs.                    |          |          |          |        | 210    | 225     | 265     |
| Fox trip, fig. 1861 - - - - -            | \$71 00  | 83 00    | 87 00    | 95 00  | 99 00  | 105 00  | 115 00  |
| Weight - - - - - lbs.                    | 50       | 60       | 80       | 110    | 130    | 140     | 220     |
| Extra slips for Fox trip spear - per set | \$28 00  | 29 00    | 30 00    | 31 00  | 32 00  | 33 00   | 35 00   |
| Bull Dog, fig. 1863 - - - - -            | 45 00    | 55 00    | 58 00    | 65 00  | 68 00  | 74 00   | 82 00   |
| Weight - - - - - lbs.                    | 50       | 60       | 80       | 100    | 110    | 125     | 180     |

|                                          |          |         |         |         |         |         |      |
|------------------------------------------|----------|---------|---------|---------|---------|---------|------|
| Size of casing - - - - - inches          | 6 ¾      | 7 ¾     | 8½      | 9 ¾     | 10      | 11 ¾    | ---- |
| Size of pin - - - - - inches             | 2½ x 3½  | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | ---- |
| Mack's spear, fig. 1857 - - - - -        | \$220 00 | 257 00  | 275 00  | 315 00  | 325 00  | ----    | ---- |
| Weight - - - - - lbs.                    | 300      | 375     | 425     | 650     | 700     | ----    | ---- |
| Fox trip, fig. 1861 - - - - -            | \$121 00 | 137 00  | 147 00  | 179 00  | 196 00  | 237 00  | ---- |
| Weight - - - - - lbs.                    | 250      | 320     | 360     | 425     | 450     | 580     | ---- |
| Extra slips for Fox trip spear - per set | \$37 00  | 40 00   | 42 00   | 47 00   | 51 00   | 60 00   | ---- |
| Bull Dog, fig. 1863 - - - - -            | 87 00    | 101 00  | 109 00  | 128 00  | 133 00  | 155 00  | ---- |
| Weight - - - - - lbs.                    | 210      | 260     | 290     | 340     | 350     | 430     | ---- |

## WEDGE AND JAR FOR CASING CUTTER

Fig. 1872



To expand the cutters in fig. 1870. The wedge is lowered through tubing by means of small rope attached to eye in head.

|                                   |         |       |       |       |       |       |       |
|-----------------------------------|---------|-------|-------|-------|-------|-------|-------|
| Size of casing to cut - - inches  | 3       | 4½    | 4½    | 5     | 5 ¾   | 5 ¾   | 6½    |
| Weight - - - - - lbs.             | 30      | 40    | 50    | 55    | 60    | 60    | 70    |
| Cutter, with wedge and jar, comp. | \$49 00 | 52 00 | 54 00 | 58 00 | 60 00 | 62 00 | 67 00 |
| Cutter wheels - - - - - per set   | 5 50    | 5 50  | 5 50  | 5 50  | 5 50  | 5 50  | 5 50  |

|                                   |         |       |       |       |       |        |      |
|-----------------------------------|---------|-------|-------|-------|-------|--------|------|
| Size of casing to cut - - inches  | 6 ¾     | 7 ¾   | 8½    | 9 ¾   | 10    | 11 ¾   | ---- |
| Weight - - - - - lbs.             | 80      | 90    | 100   | 110   | 120   | 140    | ---- |
| Cutter, with wedge and jar, comp. | \$69 00 | 77 00 | 81 00 | 91 00 | 94 00 | 116 00 | ---- |
| Cutter wheels - - - - - per set   | 5 50    | 6 00  | 6 00  | 6 00  | 6 00  | 6 00   | ---- |

## CASING CUTTER Fig. 1870



To cut casing at any point in the well when the entire "string" cannot be pulled. Used on tubing.

When ordering, state size of pin, style of taper, number of threads to inch (flat or sharp), size of wrench square; also diameter of hole in which to l is to be used.

Fig. 1860

SIDE VIEW—Showing method of setting slips

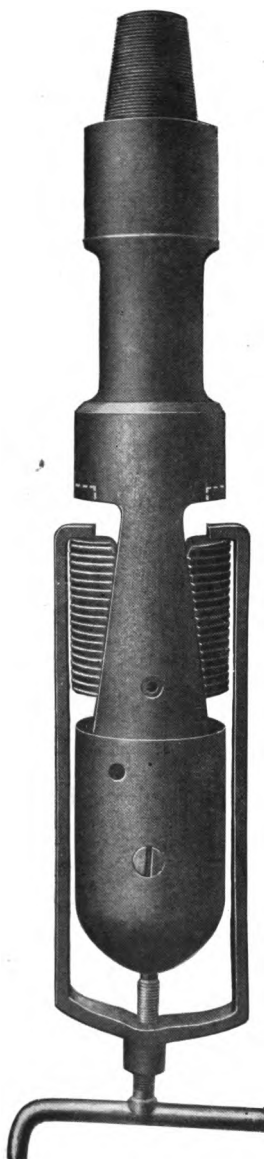


Fig. 1860-A

FRONT VIEW—Showing slips released from casing hold and locked to insure free passage from well



## HENDERSON TRIP CASING SPEAR

The HENDERSON Casing Spear is constructed with all working parts enclosed in such a manner that gravel, sand or mud cannot interfere with its operation.

It can be set in one minute without taking spear apart.

It has a plunger instead of a mandrel and will positively trip without the difficulty usually encountered with spears of the mandrel type.

It will stand rough usage without damage to the inner working parts.

It can be repaired at less cost than any other trip spear on the market.

It may be used to swedge through the tight places in the casing.

An extra plunger is furnished "no charge", thus making the spear to catch any weight of a given size pipe or casing.

Its price is not higher than others, thus making it the most economical.

### PRICE LIST

|                                       |   |      |          |
|---------------------------------------|---|------|----------|
| Size to catch $3\frac{1}{2}$ " Casing | - | each | \$ 75 00 |
| " $4\frac{1}{4}$ " "                  | - | "    | 90 00    |
| " $4\frac{1}{2}$ " "                  | - | "    | 105 00   |
| " 5" "                                | - | "    | 120 00   |
| " $5\frac{5}{16}$ " "                 | - | "    | 125 00   |
| " $5\frac{3}{8}$ " "                  | - | "    | 130 00   |
| " $6\frac{1}{4}$ " "                  | - | "    | 140 00   |

|                                       |   |      |          |
|---------------------------------------|---|------|----------|
| Size to catch $6\frac{5}{8}$ " Casing | - | each | \$150 00 |
| " $7\frac{5}{8}$ " "                  | - | "    | 170 00   |
| " $8\frac{1}{4}$ " "                  | - | "    | 180 00   |
| " $9\frac{5}{8}$ " "                  | - | "    | 225 00   |
| " 10" "                               | - | "    | 245 00   |
| " $11\frac{5}{8}$ " "                 | - | "    | 300 00   |



## TOOLS FOR SPLITTING, PERFORATING, AND RE-CUTTING THREADS ON CASING IN WELL

**CASING SPLITTER**

Fig. 1867



Showing position of knives when lowered in well.

For splitting casing to let sediment around it run into well, so casing may be removed.



Showing action of friction loop forcing knives into casing.

**CASING PERFORATOR**

Fig. 1865



Showing position of perforators when the tool is being lowered into casing.

For perforating casing in well. Can be successfully operated at any depth.



Showing action of perforators.

**MANDREL OR BELL SOCKET**

Fig. 1876



To take hold of casing that has collapsed or parted.

A given size denotes the inside diameter of casing or pipe to be caught.

| Size of casing                     | Inches | 4¼      | 4½      | 5     | 5½      | 6¼      | 6½      | 7½      | 8¼      | 10      | 10½     | 12½     |
|------------------------------------|--------|---------|---------|-------|---------|---------|---------|---------|---------|---------|---------|---------|
| Size of pin                        | Inches | 1½ x 2½ | 1½ x 2½ | 2 x 3 | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ | 2½ x 3½ |
| Casing splitters, fig. 1867        |        | \$59 00 | 61 00   | 66 00 | 72 00   | 78 00   | 81 00   | 90 00   | 96 00   | 100 00  | 105 00  | 125 00  |
| Weight                             | lbs.   | 100     | 100     | 120   | 120     | 175     | 200     | 280     | 340     | 400     | 450     | 550     |
| Perforators, fig. 1865             |        |         |         |       | 120 00  | 120 00  |         | 200 00  | 200 00  | 225 00  | 235 00  | 257 00  |
| Weight                             | lbs.   |         |         |       | 250     | 250     |         | 375     | 375     | 700     | 750     | 950     |
| Mandrel or bell sockets, fig. 1876 |        | \$40 00 | 51 00   | 57 00 | 65 00   | 72 00   | 77 00   | 88 00   | 96 00   |         |         |         |
| Weight                             | lbs.   | 80      | 90      | 110   | 140     | 180     | 200     | 230     | 250     |         |         |         |

**CASE-HARDENED****NIPPLE**

Fig. 1856



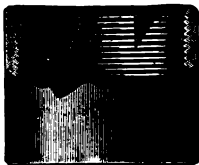
Figs. 1856 and 1856-C have one end filed and case-hardened.

Will not stand much wear or abuse.

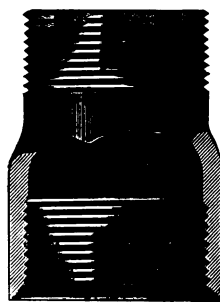
Case-hardened and forged steel nipples are for re-cutting threads on casing or in casing couplings when lost in the well.

**CASE-HARDENED COUPLING**

Fig. 1856-C

**FORGED STEEL NIPPLE—Fig. 1856-A**

The forged steel nipple has both ends filed and case-hardened.



Male and female

Are very serviceable; can be used a number of times.

| Size                              | Inches | 3       | 4     | 4¼    | 4½    | 5     | 5½    | 5¾    | 6¼    | 6½    | 7½    | 8¼    | 9½    | 10    | 11½ |
|-----------------------------------|--------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
| Case-hardened nipples, fig. 1856  |        | \$2 50  | 2 85  | 2 85  | 3 15  | 3 75  | 3 75  | 4 00  | 4 60  | 5 25  | 5 50  | 7 25  | 9 50  | 11 00 |     |
| Weight                            | lbs.   | 8       | 9     | 10    | 12    | 13    | 14    | 15    | 17    | 20    | 20    | 28    | 32    | 34    |     |
| Case-hardened couplings           |        | \$1 75  | 2 00  | 2 15  | 2 25  | 2 40  | 2 60  | 3 00  | 3 25  | 3 75  | 4 25  | 6 25  | 7 00  | 8 75  |     |
| Weight                            | lbs.   | 2.5     | 3.9   | 4     | 5.7   | 5.9   | 6.4   | 7.9   | 9.7   | 14    | 15.4  | 24.5  | 26    | 30    |     |
| Forged steel nipples, fig. 1856-A |        | \$10 00 | 12 00 | 13 50 | 15 00 | 15 50 | 16 00 | 18 00 | 19 00 | 21 00 | 22 50 | 28 00 | 29 00 | 36 00 |     |
| Weight                            | lbs.   | 12      | 12    | 14    | 16    | 15    | 15    | 17    | 18    | 25    | 27    |       |       |       |     |



## TOOLS FOR DRAWING CASING OR PIPE FROM WELL

### RING AND WEDGES—Fig. 1924

Used for pulling long strings of drive pipe or casing. The ring is heavy and capable of sustaining any weight. The wedges are cut from fine tool steel.

|                            |         |        |        |        |        |        |        |        |        |
|----------------------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| Size ring - - - - inches   | 4½      | 5½     | 6½     | 6¾     | 7¾     | 8¼     | 10     | 12     | 13     |
| With wedges - - - - inches | 4½, 4¾  | 5½, 4¾ | 6½, 5  | 6¾, 5¾ | 7¾, 5¾ | 8¼, 6¾ | 10, 8¾ | 12, 10 | 13, 10 |
| Price - - - - -            | \$73 00 | 91 00  | 101 00 | 107 00 | 122 00 | 132 00 | 160 00 | 191 00 | 207 00 |
| Weight - - - - - lbs.      | 250     | 350    | 350    | 410    | 480    | 660    | 700    | 815    | 815    |

### EXTRA WEDGES

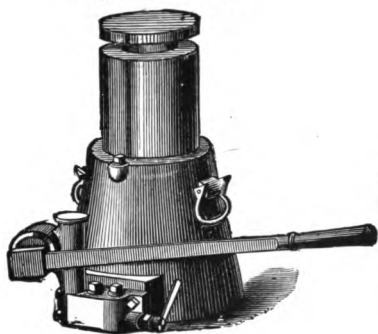
|                             |         |        |       |        |        |        |        |        |        |
|-----------------------------|---------|--------|-------|--------|--------|--------|--------|--------|--------|
| Size of wedges - - - inches | 4¾, 4¾  | 4¾, 5½ | 5, 6½ | 5¾, 6¾ | 5¾, 7¾ | 6¾, 8¼ | 8¼, 10 | 10, 12 | 10, 13 |
| Size rings for - - - inches | 4¾      | 5½     | 6½    | 6¾     | 7¾     | 8¼     | 10     | 12     | 13     |
| Per set - - - - -           | \$22 00 | 27 00  | 30 00 | 32 00  | 37 00  | 40 00  | 48 00  | 59 00  | 62 00  |
| Weight - - - - - lbs.       | 27      | 60     | 65    | 75     | 85     | 95     | 120    | 180    | 190    |

### HYDRAULIC JACKS

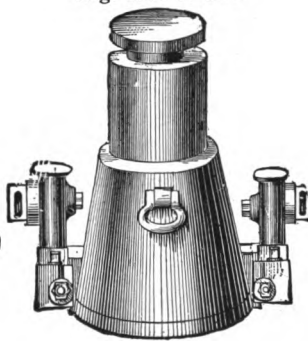
Fig. 1928 or 3145

Fig. 1930 or 3147

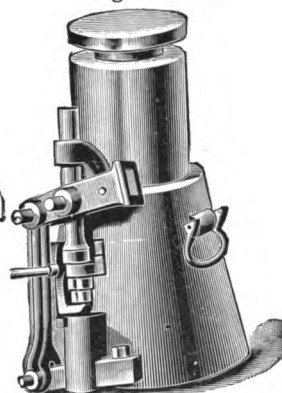
Fig. 3149



Single pump



Double pump



Used in connection with ring and wedges

Fig. 3149 was designed especially for pulling pipe or casing. Double piston single outside pump

| Jack to lift, tons | Raise, inches | Total height, inches | Weight, lbs. | Single pump, Fig. 1928, each | Double pump, Fig. 1930, each |
|--------------------|---------------|----------------------|--------------|------------------------------|------------------------------|
| 60                 | 12            | 20½                  | 360          | \$240 00                     | 340 00                       |
| 100                | 12            | 20¾                  | 460          | 300 00                       | 400 00                       |
| 125                | 12            | 20¾                  | 600          | 360 00                       | 460 00                       |
| 150                | 12            | 20¾                  | 800          | 425 00                       | 525 00                       |

### DOUBLE PISTON SINGLE OUTSIDE PUMP. Fig. 3149

| Jack to lift, tons | Raise, inches | Total height, in. | Weight, lbs. | Diam. of base, in. | Each     |
|--------------------|---------------|-------------------|--------------|--------------------|----------|
| 60                 | 12            | 20½               | 380          | 12                 | \$240 00 |
| 60                 | 18            | 26½               | 430          | 13                 | 260 00   |
| 100                | 12            | 20¾               | 480          | 13                 | 300 00   |
| 100                | 18            | 26¾               | 580          | 14                 | 340 00   |
| 125                | 12            | 20¾               | 600          | 14                 | 360 00   |
| 125                | 18            | 26¾               | 700          | 15                 | 400 00   |

### PACKING FOR HYDRAULIC JACKS "U" CUP

Fig. 3153

Fig. 3155



Prices quoted upon application.

### PULLING RING REST FOR HYDRAULIC JACKS Fig. 3151



Per pair - - - - - \$5 00

FISHING TOOLS FOR PUMPING WELLS

**COMMON**  
Fig. 1888



**TUBING SPEARS**  
**WITH SOCKET**  
Fig. 1884



**WITH SHOE SOCKET**  
Fig. 1886



This spear is made with either tubing or tool thread.

**COMBINATION**  
Fig. 1895



To use with tubing.  
Prices on application.

**COMBINATION TUBING & SUCKER ROD SOCKET**  
Fig. 1896



With three sets of slips, to catch tubing, tubing collars or sucker rods.

**SUCKER ROD SPEAR**  
Fig. 1902



With 1/4-inch pin.

|                                             |         |       |       |
|---------------------------------------------|---------|-------|-------|
| Size tubing to catch - - - - - inches       | 2       | 2½    | 3     |
| Common spear, fig. 1883 - - - - -           | \$17 00 | 19 50 | 21 50 |
| Weight - - - - - lbs.                       | 40      | 55    | 70    |
| Spear with socket, fig. 1884 - - - - -      | \$34 50 | 39 00 | 43 00 |
| Weight - - - - - lbs.                       | 120     | 130   | 150   |
| Spear with shoe socket, fig. 1886 - - - - - | \$36 00 | 42 00 | 46 00 |
| Weight - - - - - lbs.                       | 110     | 140   | 160   |

| COMBINATION TUBING AND SUCKER ROD SOCKET—Fig. 1896 |         |         | SUCKER ROD SPEAR Fig. 1902    |        |       |
|----------------------------------------------------|---------|---------|-------------------------------|--------|-------|
| Size of pin - - inches                             | 2½ x 3½ | 2¾ x 3¾ | Size sucker rods for - inches | 1½     | 1¾    |
| Size of hole - - inches                            | 5½      | 6¼      | Length in clear - - feet      | 6      | 30    |
| Price - - - - -                                    | \$75 00 | 85 00   | Price - - - - -               | \$7 50 | 17 50 |
| Weight - - - - - lbs.                              | 120     | 150     | Weight - - - - - lbs.         | 10     | 40    |

Figs. 1671, 1890



TUBING SUB

Used to connect tubing with tools. Made with tubing thread on lower end.

|                        |         |       |         |         |         |
|------------------------|---------|-------|---------|---------|---------|
| Size of pin - - inches | 1½ x 2½ | 2 x 3 | 2½ x 3½ | 2½ x 3½ | 2¾ x 3¾ |
| Each - - - - -         | \$7 00  | 9 00  | 10 00   | 11 50   | 12 50   |
| Weight - - - - -       | 30      | 50    | 60      | 80      | 90      |

## FISHING TOOLS FOR PUMPING WELLS

## SUCKER ROD SOCKETS

COMMON



Fig. 1904

COMBINATION



Fig. 1898

HITCHCOCK



Fig. 1894

SLIP SOCKET  
FOR IRON RODS

Fig. 1794

| Size of rods           | inches  | 1½      | 1¾    | 1⅞    | 2¼    | 2½    |
|------------------------|---------|---------|-------|-------|-------|-------|
| Size of tubing         |         | 2       | 2½    | 3     | 3     | 4     |
| Common, fig. 1904      |         | \$3 50  |       |       | 5 00  |       |
| Weight                 | lbs.    | 10      |       |       | 36    |       |
| Combination, fig. 1898 |         | \$10 00 | 13 00 | 16 00 | 16 00 | 22 00 |
| Weight                 | lbs.    | 100     |       |       |       |       |
| Slips                  |         | \$4 00  |       |       |       |       |
| Hitchcock, fig. 1894   |         | 8 00    | 10 50 | 12 00 | 13 50 | 15 00 |
| Weight                 | lbs.    | 8       | 12    | 15    |       |       |
| Extra slips            | Per set | \$0 75  |       |       |       |       |
| Set screw              | each    | 02      |       |       |       |       |

## SLIP SOCKET FOR IRON RODS—Fig. 1794

| Size of rods                         | inches | 1⅞     | 2    | 2½   |
|--------------------------------------|--------|--------|------|------|
| Weight                               | lbs.   | 3.5    | 3.5  | 7    |
| Regular socket                       |        | \$4 00 | 4 00 | 5 00 |
| Special socket with three sets slips |        | 7 00   | 7 00 |      |
| Extra slips, per set of 3            |        | 2 00   | 2 00 | 2 50 |
| Extra springs                        |        | 15     | 15   | 25   |

## PENNELL &amp; BRIGGS PATENT SUCKER ROD SOCKET

| Size of rods   | inches  | 1½      | 1¾    | 2¼    | 2½    |
|----------------|---------|---------|-------|-------|-------|
| Size of tubing | inches  | 3       | 4     | 3     | 4     |
| Price          |         | \$25 00 | 37 50 | 25 00 | 37 50 |
| Extra slips    | per set | 4 00    | 5 00  | 4 00  | 5 00  |

## BRANDON'S IMPROVED SUCKER ROD SOCKET

|                                      |         |
|--------------------------------------|---------|
| Complete with iron rod attachment    | \$13 00 |
| Complete without iron rod attachment | 10 00   |
| Lower valve spear                    | 2 00    |
| Combination valve puller             | 4 00    |



## FISHING TOOLS FOR PUMPING WELLS

## ROPE GRAB

Fig. 1906



With  $\frac{7}{8}$ -inch  
sucker rod pin  
Weight, 10 lbs.

## ROPE WORM

Fig. 1912



With  $\frac{7}{8}$ -inch  
sucker rod pin  
Weight, 2 lbs.

## PACKER RUBBER GRAB

Fig. 1908



With  $\frac{7}{8}$ -inch  
sucker rod pin  
Weight, 8 lbs.

## VALVE CUP GRAB

Fig. 1910



With  $\frac{7}{8}$ -inch  
sucker rod pin  
Weight, 4 lbs.

|                                                           |         |
|-----------------------------------------------------------|---------|
| Rope grab, fig. 1906 - - - - -                            | \$11 50 |
| Rope grab, fig. 1906, three-wing - - - - -                | 15 00   |
| Rope worm, fig. 1912 - - - - -                            | 7 00    |
| Packer rubber grab, fig. 1908 - - - - -                   | 9 50    |
| 1 $\frac{1}{2}$ -inch valve cup grab, fig. 1910 - - - - - | 7 00    |

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## WELL CLEANING TOOLS

## CONDUCTOR BAILER

Fig. 1967



## WROUGHT IRON BAILERS

REGULAR

Fig. 1625 or 1940

DOUBLE END

Fig. 1943



Made to order

## BAILER BAIL

Fig. 1627



## BAILER VALVE

Fig. 1628



| Diam., inches | Length, feet | Weight, lbs. | Price   |
|---------------|--------------|--------------|---------|
| 10            | 5            | ---          | \$30 00 |
| 11            | 5            | ---          | 34 50   |

## WROUGHT IRON BAILERS

| Diameter                  | 2 1/2   | 3     | 3 1/4 | 3 3/4 | 3 3/4 | 4      | 4 1/4  | 4 1/2  |
|---------------------------|---------|-------|-------|-------|-------|--------|--------|--------|
| Diameter well used in     | 3 1/4   | 3 1/2 | 4     | 4 1/4 | 4 1/2 | 5      | 5      | 5 1/2  |
| Length of bailer, 19 feet | \$11 50 | 14 00 | 15 50 | 17 00 | 18 00 | 20 00  | 21 50  | 23 00  |
| Weight                    | 72      | 83    | 94    | 105   | 110   | 126    | 142    | 156    |
| Length of bailer, 22 feet | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Weight                    | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Length of bailer, 25 feet | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Weight                    | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Bails, only               | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Weight                    | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Valves, only              | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Weight                    | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Diameter                  | 5       | 5 1/2 | 6     | 7     | 8     | 9      | 10     | 11     |
| Diameter well used in     | 6 1/4   | 6 3/4 | 7 3/4 | 8 1/4 | 10    | 11     | 12     | 13     |
| Length of bailer, 19 feet | \$27 00 | 35 00 | 36 50 | 43 00 | 54 00 | 64 00  | 80 00  | 95 00  |
| Weight                    | 182     | 228   | 238   | 287   | 340   | 433    | 540    | 630    |
| Length of bailer, 22 feet | \$28 50 | 37 50 | 39 00 | 46 00 | 58 00 | 68 00  | 82 50  | 105 00 |
| Weight                    | 204     | 260   | 268   | 322   | 380   | 483    | 590    | 690    |
| Length of bailer, 25 feet | \$33 00 | 42 00 | 44 00 | 52 00 | 65 50 | 78 00  | 95 00  | 115 00 |
| Weight                    | 226     | 290   | 298   | 357   | 420   | 513    | 620    | 720    |
| Bails, only               | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Weight                    | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Valves, only              | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Weight                    | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Diameter                  | 12      | 14    | 16    | 18    | 20    | 22     | 24     | 26     |
| Diameter well used in     | 14      | 16    | 18    | 20    | 22    | 24     | 26     | 28     |
| Length of bailer, 19 feet | \$42 00 | 54 00 | 58 00 | 68 00 | 82 00 | 98 00  | 118 00 | 142 00 |
| Weight                    | 300     | 380   | 400   | 480   | 580   | 700    | 840    | 980    |
| Length of bailer, 22 feet | \$48 00 | 60 00 | 64 00 | 74 00 | 88 00 | 104 00 | 124 00 | 148 00 |
| Weight                    | 340     | 420   | 440   | 520   | 620   | 740    | 880    | 1020   |
| Length of bailer, 25 feet | \$54 00 | 66 00 | 70 00 | 80 00 | 94 00 | 110 00 | 130 00 | 154 00 |
| Weight                    | 380     | 460   | 480   | 560   | 660   | 780    | 920    | 1060   |
| Bails, only               | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Weight                    | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Valves, only              | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |
| Weight                    | ---     | ---   | ---   | ---   | ---   | ---    | ---    | ---    |

For each band add extra to list for 4 inches and smaller - - - - - \$1 50  
 For each band add extra to list for 4 1/4 to 5 1/2 inch - - - - - 2 00  
 For each band add extra to list for 6 to 7 inch - - - - - 2 50  
 For each band add extra to list for 8 to 10 inch - - - - - 2 50

**SECTIONAL FLUSH  
JOINT BAILER**

Fig. 1948



(Three sections)

**WELL DRILLING TOOLS**

FOR CABLE SYSTEM

**WELL CLEANING TOOLS****TOP AND BOTTOM**

For casing bailer

Fig. 1944



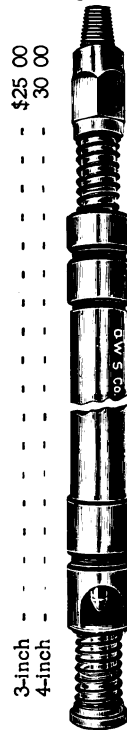
Top

Fig. 1945



Bottom

Tubes 18 inches long attached to top and bottom, between which bailer tubes of desired number or length may be inserted.

**GRAVITY BAILER**  
With one joint of pipe  
Fig. 1950\$25 00  
\$30 003-inch  
4-inch**SECTIONAL FLUSH JOINT BAILER—Fig. 1948**

| Size - - - - - inches              | 3       | 3½    | 4     | 4½    | 5     | 5½    | 6      | 7      |
|------------------------------------|---------|-------|-------|-------|-------|-------|--------|--------|
| Length - - - - - feet              | 40      | 40    | 40    | 40    | 40    | 40    | 40     | 40     |
| Weight - - - - - lbs.              | 175     | 210   | 260   | 300   | 350   | 405   | 470    | 550    |
| Price - - - - -                    | \$40 00 | 50 00 | 58 50 | 67 00 | 77 00 | 97 50 | 110 00 | 130 00 |
| Connections or flush joints - each | 8 50    | 10 50 | 12 50 | 14 50 | 16 50 | 18 50 | 22 50  | 27 00  |
| Weight - - - - - lbs.              | 10      | 15    | 18    | 20    | 20    | 25    | 27     | 30     |

**TOP AND BOTTOM FOR CASING BAILER—Figs. 1944-5**

| Size of casing - - inches  | 4½      | 4½    | 5     | 5⅜    | 5½    | 6½    | 6½    | 7½    | 8½    |
|----------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| Price (top and bottom) - - | \$17 50 | 19 50 | 22 00 | 22 50 | 25 00 | 27 50 | 30 50 | 36 50 | 43 50 |
| Weight - - - - - lbs.      | 50      | 60    | 80    | 90    | 100   | 110   | 120   | 130   | 140   |

Fig. 1630

**BAILER DUMP**

To lower water into a well that is liable to cave if water is poured in from the top in the ordinary way.

Fastened to bailer dart with bolt, and sufficient tubing screwed on below to dump at desired point.

Price - - - - - \$7 00

Weight, 15 lbs.





**WELL DRILLING TOOLS**

FOR CABLE SYSTEM

**WELL CLEANING TOOLS****SUCKER VALVES FOR MORAHAN SAND PUMPS**

Not illustrated

|                                |                                      |                    |    |                 |
|--------------------------------|--------------------------------------|--------------------|----|-----------------|
| Size pump for - - - - - inches | 3, 3 $\frac{1}{4}$ , 3 $\frac{1}{2}$ | 4, 4 $\frac{1}{2}$ | 5  | 5 $\frac{1}{2}$ |
| Each - - - - -                 | \$0 60                               | 75                 | 85 | 1 00            |

**SAND PUMP BAILS**

Not illustrated

Fig. 1964

|                            |                 |                 |                 |                 |                 |                 |                 |
|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Size pump for - - - inches | 3               | 3 $\frac{1}{4}$ | 3 $\frac{1}{2}$ | 3 $\frac{3}{4}$ | 4               | 4 $\frac{1}{2}$ | 4 $\frac{3}{4}$ |
| Morahan or Robert's - - -  | \$4 25          | 4 50            | 4 50            | 4 75            | 5 50            | 5 75            | 5 75            |
| Weight - - - - - lbs.      | 8               | 9               | 9               | 10              | 10              | 10              | 10              |
| Size pump for - - - inches | 4 $\frac{1}{2}$ | 5               | 5 $\frac{3}{8}$ | 5 $\frac{5}{8}$ | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 7 $\frac{5}{8}$ |
| Morahan or Robert's - - -  | \$6 50          | 6 50            | 7 00            | 7 00            | 7 75            | 12 00           | 13 25           |
| Weight - - - - - lbs.      | 16              | 18              | 18              | 18              | 24              | 24              | 36              |

**CHICKERING PATENT SAND PUMP—Fig. 1964**

|                    |                 |                     |                 |                 |                 |                 |                     |                  |                 |
|--------------------|-----------------|---------------------|-----------------|-----------------|-----------------|-----------------|---------------------|------------------|-----------------|
| Size - - - in.     | 3               | 3 $\frac{1}{4}$     | 3 $\frac{1}{2}$ | 3 $\frac{3}{4}$ | 4               | 4 $\frac{1}{2}$ | 4 $\frac{1}{2}$     | 4 $\frac{3}{4}$  | 5               |
| Size hole for, in. | 4 $\frac{1}{4}$ | 4 $\frac{1}{2}$     | 4 $\frac{3}{8}$ | 5               | 5 $\frac{1}{2}$ | 5 $\frac{5}{8}$ | 5 $\frac{5}{8}$ , 6 | 6                | 6 $\frac{1}{4}$ |
| Price - - - -      | \$17 00         | 17 00               | 19 00           | 21 00           | 21 50           | 23 00           | 25 00               | 26 00            | 26 50           |
| Weight - - lbs.    | 59              | 67                  | 75              | 88              | 88              | 90              | 92                  | 108              | 114             |
| Size - - - in.     | 5 $\frac{3}{8}$ | 5 $\frac{5}{8}$     | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 7 $\frac{5}{8}$ | 8 $\frac{5}{8}$ | 9 $\frac{5}{8}$     | 11 $\frac{5}{8}$ | -----           |
| Size hole for, in. | 6 $\frac{3}{8}$ | 7 $\frac{5}{8}$ , 8 | 8 $\frac{5}{8}$ | 9 $\frac{5}{8}$ | 10              | 12, 14          | -----               | -----            | -----           |
| Price - - - -      | \$28 00         | 29 50               | 38 00           | 44 00           | 57 00           | 61 00           | 67 00               | 159 00           | -----           |
| Weight - - lbs.    | 140             | 150                 | 155             | 186             | 260             | 320             | 380                 | 486              | -----           |

**SAND PUMP JARS OR PLUNGERS**

Not illustrated

|                                              |                 |                 |                 |                 |                 |                 |                 |                  |       |
|----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-------|
| Size pump for - inches                       | 3               | 3 $\frac{1}{4}$ | 3 $\frac{1}{2}$ | 3 $\frac{3}{4}$ | 4               | 4 $\frac{1}{2}$ | 4 $\frac{1}{2}$ | 4 $\frac{3}{4}$  | 5     |
| Chickering's, complete with sucker valve - - | \$9 50          | 9 50            | 10 75           | 11 75           | 12 00           | 12 75           | 13 75           | 14 00            | 15 00 |
| Robert's - - - - -                           | 5 00            | 5 00            | 5 00            | 6 50            | 6 50            | 7 00            | 7 50            | 7 50             | 7 75  |
| Size pump for - inches                       | 5 $\frac{3}{8}$ | 5 $\frac{5}{8}$ | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 7 $\frac{5}{8}$ | 8 $\frac{1}{4}$ | 9 $\frac{5}{8}$ | 11 $\frac{5}{8}$ | ----- |
| Chickering's, complete with sucker valve - - | \$15 50         | 15 50           | 22 00           | 25 00           | 33 00           | 34 00           | 40 00           | 46 00            | ----- |
| Robert's - - - - -                           | 8 50            | 8 50            | 9 50            | 10 00           | 11 00           | 12 00           | -----           | -----            | ----- |

**SWIVEL TOP SAND PUMP BAIL**

Not illustrated

Fig. 1969

|                       |                 |                 |                 |                 |
|-----------------------|-----------------|-----------------|-----------------|-----------------|
| Size - - - - - inches | 5 $\frac{5}{8}$ | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 7 $\frac{5}{8}$ |
| Price - - - - -       | \$13 50         | 16 50           | 17 00           | 21 00           |

**BANNISTER SAND PUMP VALVE—Fig. 1969**

|                        |         |       |                 |       |                 |                 |       |                 |
|------------------------|---------|-------|-----------------|-------|-----------------|-----------------|-------|-----------------|
| Size pump for - inches | 3       | 4     | 4 $\frac{1}{2}$ | 5     | 5 $\frac{5}{8}$ | 7 $\frac{5}{8}$ | 8     | 9 $\frac{5}{8}$ |
| Wrought iron - - - -   | \$17 50 | ----- | 21 75           | 24 00 | 25 50           | 36 00           | 36 00 | 46 00           |
| Malleable iron - - -   | 1 50    | 1 50  | -----           | 2 00  | 2 50            | -----           | ----- | -----           |



## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## WELL CLEANING TOOLS

## MODEL SAND PUMP

Fig. 1632 or 1953



Fig. 1631 or 1952



## MODEL SAND PUMP BOTTOM

Fig. 1633 or 1954

CALIFORNIA SAND PUMP  
BOTTOM

Fig. 1962



## MODEL SAND PUMP AND PARTS

| Diameter - - inches   | 3 $\frac{3}{4}$ | 4     | 4 $\frac{1}{2}$ | 5                                 | 5 $\frac{1}{2}$                   | 6                   | 7                  | 8     | 9                    | 10    |
|-----------------------|-----------------|-------|-----------------|-----------------------------------|-----------------------------------|---------------------|--------------------|-------|----------------------|-------|
| Size hole for, inches | 5               | 5     | 5 $\frac{3}{8}$ | 5 $\frac{5}{8}$ , 6 $\frac{1}{4}$ | 6 $\frac{1}{4}$ , 6 $\frac{5}{8}$ | 7 $\frac{5}{8}$ , 8 | 8, 8 $\frac{1}{4}$ | 10    | 10, 11 $\frac{5}{8}$ | 13    |
| Weight - - - lbs.     | 150             | 180   | 215             | 230                               | 250                               | 275                 | 350                | 400   | 500                  | 550   |
| Complete - - -        | \$35 00         | 35 00 | 42 50           | 45 00                             | 47 50                             | 50 00               | 52 50              | 60 00 | 62 50                | 65 00 |
| Bottoms comp. -       | 20 00           | 20 00 | 21 00           | 22 50                             | 23 50                             | 25 00               | 27 50              | 32 50 | 34 00                | 35 00 |
| Upper valves - -      | 2 50            | 2 75  | 3 00            | 3 50                              | 4 00                              | 4 50                | 5 00               | 6 00  | 7 00                 | 8 00  |
| Lower valves - -      | 3 50            | 4 00  | 4 25            | 4 50                              | 5 00                              | 5 50                | 6 25               | 7 00  | 8 00                 | 9 00  |
| Springs - - -         | 1 50            | 1 50  | 1 50            | 1 50                              | 1 50                              | 1 50                | 1 50               | 1 50  | 1 50                 | 1 50  |
| Wrenches - - -        | 75              | 75    | 75              | 75                                | 75                                | 75                  | 75                 | 75    | 75                   | 75    |

## CALIFORNIA SAND PUMP

| Size of pump - - - - inches     | 4 $\frac{1}{2}$ | 5 $\frac{5}{8}$ | 7 $\frac{5}{8}$ | 9 $\frac{5}{8}$ | 11 $\frac{5}{8}$ |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|------------------|
| Length of pump - - - - feet     | 20              | 20              | 16              | 10              | 6                |
| Pumps complete - - - -          | \$23 50         | 33 00           | 42 00           | 47 00           | 53 00            |
| Weight - - - - lbs.             | 150             | 230             | 250             | 310             | 270              |
| Bottoms only, fig. 1962 - - - - | \$9 00          | 11 00           | 15 50           | 19 00           | 27 00            |
| Balls only - - - -              | 70              | 1 50            | 2 75            | 3 75            | 5 00             |

## WELL DRILLING TOOLS

FOR CABLE SYSTEM

## WELL CLEANING TOOLS

Fig. 1977

Fig. 1991

Fig. 1983

Fig. 1986

Fig. 1935

Fig. 1936

BRADEN PATENT SAND PUMP



MOODY PATENT SAND PUMP



Prices on application

COMBINATION BIT AND MUD SOCKET



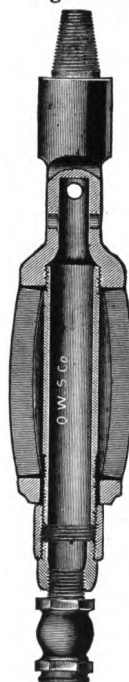
MUD SOCKET



REGULAR SWAB



IMPROVED PATTERN SWAB



## BRADEN'S PATENT SAND PUMP—Fig. 1977

5 inches diameter, 16 feet long, for 5½-inch hole - \$50 00 | Bottom only - - - \$7 00

| Size of hole for - - - - -               | inches | 5       | 5½ and larger |
|------------------------------------------|--------|---------|---------------|
| Diameter of pump - - - - -               | inches | 3       | 4             |
| Combination bit and mud socket - - - - - | -      | \$46 50 | 57 50         |
| Weight - - - - -                         | lbs.   | 210     | 260           |
| Mud socket, fig. 1986 - - - - -          | -      | \$40 00 | 51 00         |
| Weight - - - - -                         | lbs.   | 190     | 230           |

## SWABS

| Size of hole - - - - -                 | inches | 4½      | 5     | 5½    | 6       | 6½      |
|----------------------------------------|--------|---------|-------|-------|---------|---------|
| Size of pin - - - - -                  | -      | 1½ x 2½ | 2 x 3 | 2 x 3 | 2½ x 3½ | 2½ x 3½ |
| Regular, complete, fig. 1935 - - - - - | -      | \$25 00 | 26 50 | 28 00 | 31 00   | 33 00   |
| Weight - - - - -                       | lbs.   | 75      | 80    | 95    | 130     | 140     |
| Complete, less pin - - - - -           | -      | \$14 00 | 15 50 | 16 50 | 17 50   | 19 50   |
| Rubbers only - - - - -                 | -      | 7 50    | 8 50  | 9 25  | 11 00   | 13 50   |
| Improved pattern, complete - - - - -   | -      | \$24 00 | 25 00 | 26 50 | 28 00   | 31 00   |

## THE HYDRAULIC ROTARY PROCESS

For sinking deep wells is superior to all others when used in formations composed of clay, sand, or quicksand.

This process is used almost exclusively in the Texas and Louisiana oil fields and to a large extent in other localities where the conditions are suitable.

The operation consists in rapidly turning a column of pipe, the lower end of which is armed with a steel shoe having a serrated edge for cutting the formation through which it passes.

Water is kept under constant high pressure in the pipe and the detritus is thus forced to the surface, passing up on the outside of the pipe with the water.

By this means it is possible to sink a column of casing through the most stubborn beds of quicksand or other soft formations, which will not, through their lack of stability, admit of the usual procedure of first drilling the hole and then lowering the casing to form the final and lasting wall for the well.

In cases where the formation is composed of clay of sufficient density to retain the wall of the well in place, a smaller pipe is used, armed with a perforated bit, through which the water is forced in same manner, and when the depth is reached where it may be desirable to insert the casing, the drilling pipe is removed and the casing is inserted in the hole thus prepared for it.

The illustration on page 188 is a reproduction from a photograph of a Hydraulic Rotary Drilling outfit in actual operation.

The boiler is not shown, as it was set up at a distance of about fifty feet from the engine in order to avoid accidents occurring from a premature flow of oil or gas.

The suction pipe was raised to show the foot valve and strainer.

## A DRILLING OR BORING PLANT FOR THE HYDRAULIC ROTARY SYSTEM

### INCLUDES

The derrick, see page 188, and the following list of machinery and tools:

| ARTICLE                                                                  | Fig.<br>No. | Weight,<br>lbs. |
|--------------------------------------------------------------------------|-------------|-----------------|
| 1 30-horse-power boiler - - - - -                                        | 1400        | 7,800           |
| 1 23-horse-power engine - - - - -                                        | 1425        | 3,960           |
| 1 12-inch rotary table - - - - -                                         | 2190        | 1,900           |
| 1 hoisting gear or draw works - - - - -                                  | 2191        | 2,000           |
| 2 8 x 5 x 10 duplex pumps - - - - -                                      | ---         | 3,000           |
| 2 b. b. water swivels - - - - -                                          | 2192        | 450             |
| 4 20-inch bushed derrick pulleys - - - - -                               | 2204        | 250             |
| 100 feet No. 103 sprocket chain - - - - -                                | 2200        | 350             |
| 1 sprocket wheel for engine - - - - -                                    | ---         | 60              |
| 3 forged steel bushings, 6 x 4 - - - - -                                 | ---         | 138             |
| 2 forged steel bushings, 8 x 4 - - - - -                                 | ---         | 124             |
| 2 forged steel bushings, 10 x 4 - - - - -                                | ---         | 130             |
| 2 forged steel bushings, 12 x 4 - - - - -                                | ---         | 160             |
| 60 feet 2-inch wire wound rotary hose - - - - -                          | 2193        | 129             |
| 2 sets rotary hose couplings - - - - -                                   | ---         | 10              |
| 7 rotary drills, 2 6-inch, 2 8-inch, 1 10-inch, 1 12-inch, 1 15-inch - - | 2197        | 400             |
| 3 rotary shoes, 6-inch, 8-inch, 10-inch - - - - -                        | 2196        | 175             |
| 2 slide tongs, 4-inch, 6-inch - - - - -                                  | 2194        | 230             |
| 1 2½-inch strapped C-hook - - - - -                                      | 2201        | 70              |
| 5 sets elevators, 4-inch, 6-inch, 8-inch, 10-inch, 12-inch - - - - -     | 2499        | 1,490           |
| 6 sets Vulcan tongs, No. 15, No. 14, No. 13 (two each) - - - - -         | 5130        | 195             |
| 1 3½-inch round iron D. S. hook - - - - -                                | 2535        | 130             |
| 1 28-inch triple iron block - - - - -                                    | 2519        | 350             |
| 600 feet ¾-inch steel casing line - - - - -                              | 1533        | 535             |
| 1,400 feet ⅞-inch steel sand line - - - - -                              | 1526        | 520             |

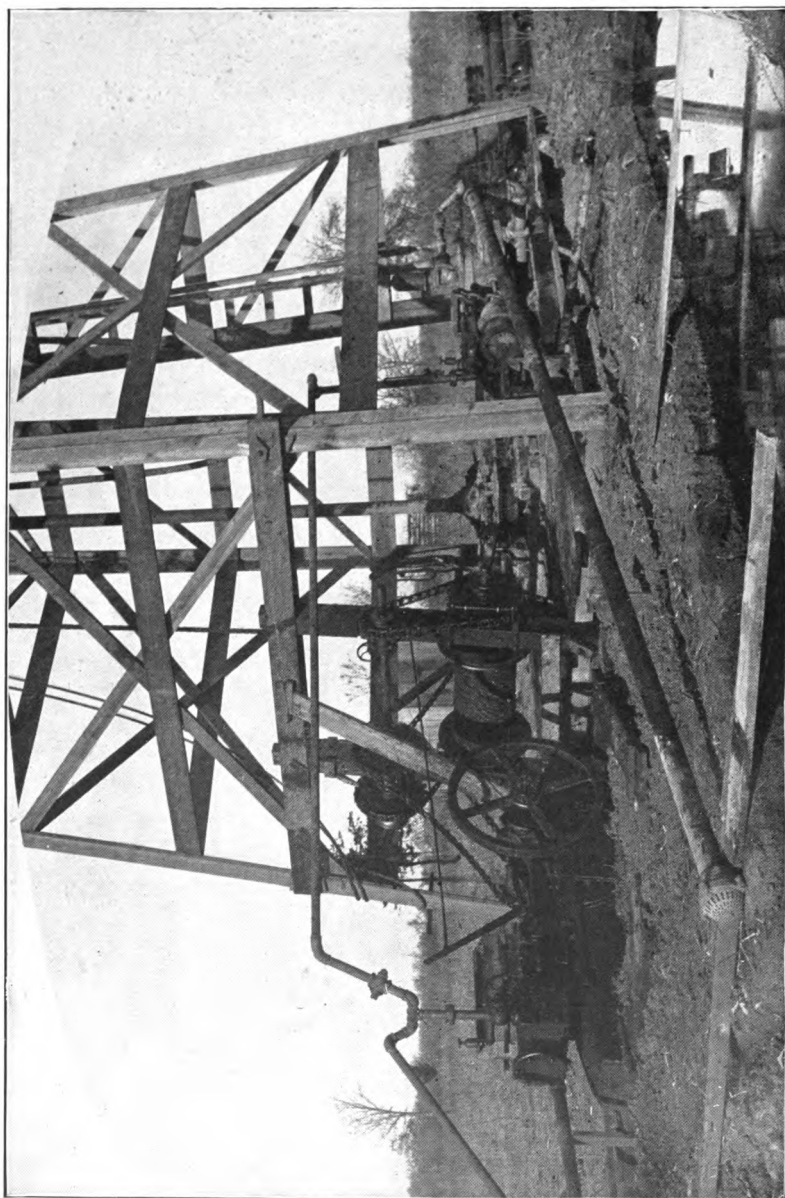
Miscellaneous tools, fittings, etc.

**Total estimated weight, 27,196 lbs.**

The estimated value of the foregoing (less derrick) is \$3,225, f. o. b. cars at Pittsburgh.

The outfit is intended for use with heavy line pipe, see page 127. Sizes, 12-inch, 10-inch, 8-inch, 6-inch, 4½-inch.

These sizes may be varied, but the bits, shoes and bushings must be made to conform to such changes.



Reproduction from photograph of an oil well in Texas, drilled by the rotary process

WELL DRILLING TOOLS

REVOLVING AND JETTING SWIVEL

Fig. 2213



HYDRAULIC HOSE COUPLING

Fig. 2214



| Size - - - inches     | 1½     | 2    | 2½    | 3     |
|-----------------------|--------|------|-------|-------|
| Per set of 4 pieces - | \$5 00 | 7 50 | 10 00 | 12 50 |
| Coupling only, each   | 1 50   | 2 25 | 3 00  | 3 75  |
| Clamp " "             | 1 00   | 1 50 | 2 00  | 2 50  |

|                                                    |         |
|----------------------------------------------------|---------|
| 2 -inch jetting swivel, O. W. S. pattern - - - - - | \$90 00 |
| 2½-inch jetting swivel, O. W. S. pattern - - - - - | 115 00  |
| 3 -inch jetting swivel, O. W. S. pattern - - - - - | 140 00  |

All less bushings.

PRESSURE HOSE, WIRED

Fig. 2193



Each outfit requires two 30-foot sections of 2-inch wired hose with couplings.

|                                                                             |         |
|-----------------------------------------------------------------------------|---------|
| 30-foot section, 2 inch, 5-ply wired pressure hose with couplings - - - - - | \$37 50 |
| 2-inch, 5-ply wired pressure hose - - - - - per foot                        | 1 00    |
| Couplings - - - - - per set of 4 pieces                                     | 7 50    |



## WELL DRILLING TOOLS

## ROTARY DRILL

Fig. 2197

HYDRAULIC AND JETTING  
ROCK DRILL

Fig. 2198



| Size pipe drills pass through - - - inches | 4      | 4½    | 5     | 6     | 7     | 8     | 9     | 10    | 12    |
|--------------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Size pipe screws to, inches                | 2      | 2     | 2½    | 2½    | 3     | 3     | 3     | 4     | 4     |
| Fig. 2197 - - - - -                        | \$6 30 | 9 20  | 10 00 | 13 50 | 16 00 | 20 00 | 27 00 | 35 00 | 42 00 |
| Fig. 2198 - - - - -                        | 8 50   | 10 00 | 12 00 | 15 00 | 20 00 | 27 00 | 32 00 | 39 00 | 47 00 |

Fig. 2199



## DRIVE PLATE

| Will drive pipe - sizes | 2 to 3 | 3 to 4½ | 3 to 6 | 4 to 7 | 4½ to 9 |
|-------------------------|--------|---------|--------|--------|---------|
| Price - - - - -         | \$2 50 | 3 40    | 5 80   | 7 50   | 10 00   |

## SPROCKET CHAIN

Fig. 2200



Fig. 2220



| Chain Number    | Working strain, lbs. | Equivalent in single leather belt | Links per foot | Per foot |
|-----------------|----------------------|-----------------------------------|----------------|----------|
| Fig. 2200 - - - | 1,800                | 14                                | 3.9            | \$0 67   |
| Fig. 2220 - - - | 3,000                | 23                                | 3.9            | 1 00     |

## SPROCKET WHEELS—No. 103

| Diameter at chain center - - - inches | 7      | 8    | 9    | 10    | 12    | 14    | 16    |
|---------------------------------------|--------|------|------|-------|-------|-------|-------|
| Number of teeth - - - - -             | 7      | 8    | 9    | 10    | 12    | 14    | 16    |
| Price - - - - -                       | \$2 50 | 3 00 | 3 20 | 3 50  | 4 00  | 4 70  | 5 25  |
| Diameter at chain center - - - inches | 18     | 20   | 23   | 30    | 36    | 48    | 60    |
| Number of teeth - - - - -             | 18     | 20   | 23   | 30    | 36    | 48    | 61    |
| Price - - - - -                       | \$6 00 | 7 25 | 9 50 | 11 50 | 15 00 | 24 00 | 40 00 |

## WELL DRILLING TOOLS

## HYDRAULIC ROTARY SYSTEM

SLIDE TONGS

Fig. 2194



SWIVEL BUSHING

Fig. 2195



ROTARY SHOE

Fig. 2196



## SLIDE TONGS

|                       |   |   |        |       |       |       |       |       |       |       |       |
|-----------------------|---|---|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Size pipe for, inches | - | - | 2½     | 3     | 3½    | 4     | 4½    | 5     | 6     | 8     | 10    |
| Price                 | - | - | \$9 00 | 11 00 | 12 50 | 14 00 | 16 00 | 18 00 | 21 00 | 30 00 | 35 00 |

## SWIVEL AND REVOLVING PIPE BUSHINGS

|                              |        |      |      |      |      |       |       |       |       |       |       |
|------------------------------|--------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| Size pipe screws to - inches | 2½     | 3    | 3½   | 4    | 4½   | 5     | 6     | 7     | 8     | 10    | 12    |
| Swivel bushings, fig. 2195 - | \$2 30 | 3 25 | 4 80 | 6 00 | 8 00 | 10 00 | 13 00 | 17 00 | 22 00 | ----- | ----- |
| Revolving pipe bushings -    | -----  | 2 50 | 3 00 | 3 50 | 4 00 | 5 00  | 7 00  | 10 00 | 14 00 | 19 00 | 25 00 |

## ROTARY SHOES—Fig. 2196

| Size pipe screws to, inches | TOOL STEEL      |              | MACHINE STEEL, CASE HARDENED |              |
|-----------------------------|-----------------|--------------|------------------------------|--------------|
|                             | Standard length | Extra length | Standard length              | Extra length |
| 2½                          | \$8 80          | \$11 80      | \$5 40                       | \$7 60       |
| 3                           | 9 60            | 13 00        | 6 60                         | 8 80         |
| 3½                          | 10 70           | 14 30        | 8 20                         | 11 00        |
| 4                           | 12 00           | 16 00        | 9 50                         | 12 50        |
| 4½                          | 13 50           | 18 50        | 11 00                        | 14 50        |
| 5                           | 15 50           | 20 50        | 12 00                        | 16 00        |
| 6                           | 17 50           | 23 00        | 13 50                        | 18 00        |
| 7                           | 20 00           | 27 00        | 15 00                        | 20 00        |
| 8                           | 22 50           | 30 00        | 17 00                        | 23 00        |
| 9                           | 29 00           | 39 00        | 22 00                        | 29 00        |
| 10                          | 36 00           | 50 00        | 27 00                        | 36 00        |
| 12                          | 64 00           | 84 00        | 48 00                        | 64 00        |

WELL DRILLING TOOLS

HYDRAULIC ROTARY SYSTEM

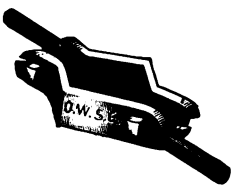
STRAPPED C-HOOK  
Fig. 2201



SWIVEL  
Fig. 2202



CLAMP  
Fig. 2203



BACK PRESSURE VALVE  
To go between pipe couplings  
Fig. 2205



FOOT VALVE  
Fig. 4968



Style, 6 inch  
and smaller

FOOT VALVE  
Fig. 4969



Style, 7 inch  
and larger

2½-inch strapped C-hook, fig. 2201 - - - - - \$10 00

SWIVELS—Fig. 2202

|                                    |        |      |      |      |       |       |
|------------------------------------|--------|------|------|------|-------|-------|
| Size pipe screws to - - - - inches | 1      | 1½   | 1½   | 2    | 2½    | 3     |
| Price - - - - -                    | \$4 50 | 6 00 | 7 50 | 9 00 | 12 00 | 15 00 |

CLAMPS—Fig. 2203

|                       |        |      |      |      |      |      |      |      |       |       |       |       |
|-----------------------|--------|------|------|------|------|------|------|------|-------|-------|-------|-------|
| Size pipe for, inches | 2½     | 3    | 3½   | 4    | 4½   | 5    | 6    | 7    | 8     | 9     | 10    | 12    |
| Price - - - - -       | \$3 50 | 4 00 | 4 50 | 5 00 | 6 00 | 7 00 | 8 00 | 9 00 | 10 00 | 12 00 | 14 00 | 25 00 |

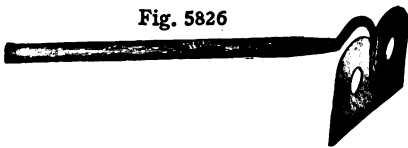
BACK PRESSURE VALVES—Fig. 2205

|                       |        |      |      |      |      |      |
|-----------------------|--------|------|------|------|------|------|
| Size - - - - - inches | 4      | 6    | 8    | 9    | 10   | 12   |
| Price - - - - -       | \$1 50 | 2 00 | 2 50 | 2 75 | 3 00 | 3 50 |

FOOT VALVES—Figs. 4968-4969

|                     |        |      |      |      |       |       |       |       |       |       |        |
|---------------------|--------|------|------|------|-------|-------|-------|-------|-------|-------|--------|
| Size - - - - inches | 2½     | 3    | 3½   | 4    | 4½    | 5     | 6     | 7     | 8     | 10    | 12     |
| Price - - - - -     | \$3 30 | 3 90 | 5 60 | 7 30 | 10 50 | 11 25 | 14 75 | 35 00 | 41 00 | 64 00 | 100 00 |

Fig. 5826



MORTAR HOES

| No. | Socket  | Handles | Price  |
|-----|---------|---------|--------|
| 8   | 10-inch | 6 feet  | \$2 20 |
| 9   | 9-inch  | 5½ feet | 2 05   |

**WELL DRILLING TOOLS**

CANADIAN POLE TOOL SYSTEM

**TAPER JOINT**

FOR WOODEN DRILL POLES

Figs. 2059 or 2833



| Number - - - - -                      | 21                                | 22                                | 23                                | 24                                | 25                      | 26                      | 27                                 | 28                                 | 29                                 |
|---------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------|-------------------------|------------------------------------|------------------------------------|------------------------------------|
| Size of box and pin, taper joint, in. | $\frac{3}{4} \times 1\frac{1}{4}$ | $\frac{3}{4} \times 1\frac{1}{4}$ | $\frac{7}{8} \times 1\frac{1}{8}$ | $\frac{5}{8} \times 1\frac{1}{8}$ | $1 \times 1\frac{1}{2}$ | $1 \times 1\frac{1}{2}$ | $1\frac{1}{4} \times 1\frac{1}{2}$ | $1\frac{1}{4} \times 1\frac{1}{2}$ | $1\frac{1}{4} \times 1\frac{1}{2}$ |
| Number of threads - - per inch        | -----                             | -----                             | 7                                 | 7                                 | 6                       | 6                       | 6                                  | 6                                  | 6                                  |
| Size of wood - - - - inches           | $1\frac{7}{8}$                    | 2                                 | 2                                 | $2\frac{1}{8}$                    | $2\frac{1}{4}$          | $2\frac{1}{2}$          | $2\frac{1}{2}$                     | $2\frac{3}{4}$                     | 3                                  |
| Number rivet holes - - - -            | 5                                 | 5                                 | 5                                 | 5                                 | 5                       | 5                       | 5                                  | 5                                  | 5                                  |
| Diameter of rivet - - - inches        | $\frac{5}{16}$                    | $\frac{5}{16}$                    | $\frac{3}{8}$                     | $\frac{3}{8}$                     | $\frac{3}{8}$           | $\frac{3}{8}$           | $\frac{3}{8}$                      | $\frac{7}{16}$                     | $\frac{7}{16}$                     |
| Length of rivet - - - inches          | $2\frac{3}{8}$                    | $2\frac{1}{2}$                    | $2\frac{1}{2}$                    | $2\frac{1}{2}$                    | $2\frac{1}{2}$          | $3\frac{1}{8}$          | $3\frac{1}{8}$                     | -----                              | -----                              |
| Size of square for wrench, inches     | 1                                 | 1                                 | $1\frac{1}{4}$                    | $1\frac{1}{4}$                    | $1\frac{1}{4}$          | $1\frac{1}{4}$          | $1\frac{1}{8}$                     | $1\frac{3}{8}$                     | $1\frac{3}{8}$                     |
| Length of straps - - - inches         | 19                                | 19                                | 19                                | 19                                | 19                      | 19                      | 19                                 | 20                                 | 20                                 |
| Total length of joint - - inches      | 45                                | 45                                | 50                                | 50                                | 50                      | 50                      | 50                                 | 55                                 | 55                                 |
| Nominal weight - - - lbs.             | 15                                | 15                                | 21                                | 21                                | 21                      | 22                      | 22                                 | 26                                 | 26                                 |
| Price - - - - -                       | \$2 00                            | 2 00                              | 2 25                              | 2 25                              | 2 50                    | 2 50                    | 2 75                               | 3 00                               | 3 75                               |

Plain white ash drill poles only, hexagon or round.

 $2\frac{1}{8}$  or  $2\frac{1}{4}$  inch x 18 feet, each - - - - - \$1 25**SPLICE FOR WOODEN DRILL POLE**

Figs. 2067 or 2849



|                              |        |                |                |                |
|------------------------------|--------|----------------|----------------|----------------|
| Size rods for - - - - inches | 2      | $2\frac{1}{8}$ | $2\frac{1}{4}$ | $2\frac{1}{2}$ |
| Per set - - - - -            | \$0 50 | 50             | 50             | 50             |

**STUB TAPER JOINT**

FOR WELDING ON IRON POLES

Figs. 2062 or 2847



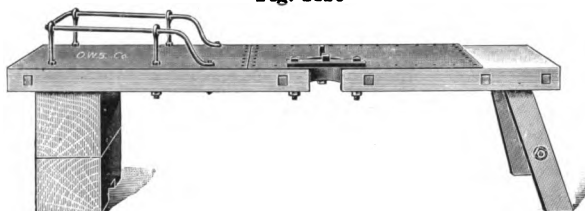
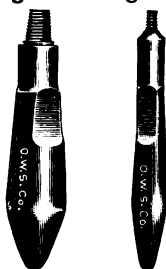
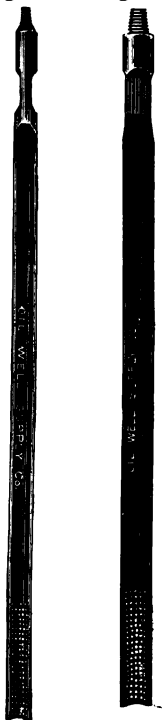
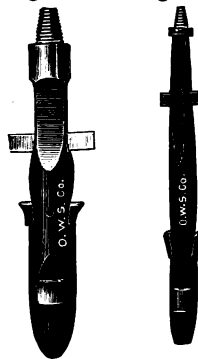
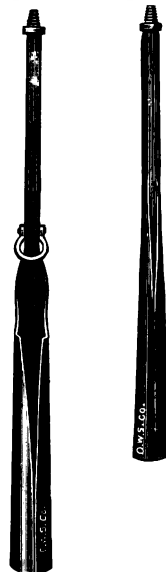
|                                    |                                   |                                   |                         |                                    |
|------------------------------------|-----------------------------------|-----------------------------------|-------------------------|------------------------------------|
| Number - - - - -                   | 61                                | 63                                | 65                      | 67                                 |
| Size of box and pin - - - inches   | $\frac{3}{4} \times 1\frac{1}{4}$ | $\frac{7}{8} \times 1\frac{1}{8}$ | $1 \times 1\frac{1}{2}$ | $1\frac{1}{4} \times 1\frac{1}{2}$ |
| Threads - - - - - per inch         | -----                             | 7                                 | 6                       | 6                                  |
| Size of rod, hollow - - - inches   | -----                             | $1\frac{1}{4}$                    | -----                   | $1\frac{1}{4}$                     |
| Size of rod, solid - - - inches    | $\frac{3}{4}$                     | -----                             | 1                       | -----                              |
| Size of square for wrench - inches | 1                                 | $1\frac{1}{4}$                    | $1\frac{1}{4}$          | $1\frac{3}{8}$                     |
| Length of joint - - - inches       | $9\frac{1}{2}$                    | 11                                | 11                      | 14                                 |
| Nominal weight - - - lbs.          | 3                                 | 5                                 | 7                       | $10\frac{1}{2}$                    |
| Price - - - - -                    | \$0 85                            | 95                                | 1 10                    | 1 40                               |

WOODEN DRILL POLE WITH JOINTS AND SPLICE—Fig. 2057



## WELL DRILLING TOOLS

CANADIAN POLE TOOL SYSTEM

REAMING  
GUIDE  
Fig. 2118WRENCH BLOCK  
Fig. 2120PIPE SWEDGES  
Fig. 2131 Fig. 2133SPUDS  
Fig. 2123 Fig. 2124CASING DOGS  
Fig. 2136 Fig. 2138FRICTION  
SOCKET  
Fig. 2128HORN SOCKETS  
Fig. 2140 Fig. 2142DRIVE OR DRAW HEAD  
Fig. 2151Made for any size pipe  
or casing

Prices for Canadian pole tools will be furnished on specification.

# WELL DRILLING TOOLS

## CANADIAN POLE TOOL SYSTEM

### TWO-LEG SOCKETS

Fig. 2149



With two dogs

Fig. 2145



With four dogs

Fig. 2147



With bonnet

Fig. 2159



Has two dogs with springs

### HALF TURN SOCKET

Fig. 2156



### ONE-LEG SOCKET

Fig. 2153



### UNDER REAMER

Fig. 2161



### BELL MOUTH DUTCHMAN

Fig. 2163



With bell for 7 1/4-inch casing

### BELLS FOR BELL MOUTH DUTCHMAN

Fig. 2164



For 5 1/8-inch casing

Fig. 2165



For 4 1/4-inch casing

Prices for Canadian pole tools will be furnished on specification.

## ELEVATORS, WROUGHT IRON

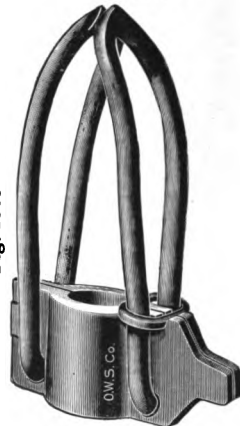
## SCOTT'S PATENT

Regular  
Fig. 2495Mannington pattern  
Extra heavy  
Fig. 2497

## FAIR'S PATENT

Regular  
Fig. 2499Mannington pattern  
Extra heavy  
Fig. 2501

## FISHER'S PATENT

Regular  
Fig. 2503Mannington pattern  
Extra heavy  
Fig. 2505

To lower or elevate pipe, tubing, or casing into or out of the well.

When ordering, state size and whether for pipe, tubing, or casing.

## PER SET OF TWO

| Size                             | inches | 1       | 1 1/4 | 1 1/2 | 2     | 2 1/4 | 3      | 3 1/4  | 4     | 4 1/2     |
|----------------------------------|--------|---------|-------|-------|-------|-------|--------|--------|-------|-----------|
| Scott's regular, fig. 2495       | - set  | \$13 00 | 14 00 | 15 00 | 19 00 | -     | -      | -      | -     | 32 50     |
| Weight, per set                  | - lbs. | 44      | 44    | 49    | 100   | -     | -      | -      | -     | 132       |
| Fair's regular, fig. 2499        | - set  | \$13 00 | 14 00 | 15 00 | 19 00 | 20 50 | 20 50  | 21 00  | 22 00 | 32 50     |
| Weight, per set                  | - lbs. | 60      | 65    | 70    | 80    | 88    | 100    | 110    | 110   | 104       |
| Fair's Mannington pattern        | - set  | -       | -     | -     | 29 50 | -     | 47 50  | 47 50  | 50 00 | 50 00     |
| Weight, per set                  | - lbs. | -       | -     | -     | 160   | -     | 174    | 174    | 188   | 188       |
| Fisher's regular, fig. 2503      | - set  | \$13 00 | 14 00 | 15 00 | 19 00 | -     | -      | -      | -     | 32 50     |
| Weight, per set                  | - lbs. | 40      | 44    | 49    | 100   | -     | -      | -      | -     | 132       |
| Fisher's Mannington pattern, set | -      | -       | -     | -     | -     | -     | -      | -      | -     | -         |
| Weight, per set                  | - lbs. | -       | -     | -     | -     | -     | -      | -      | -     | -         |
| Size                             | inches | 5       | 5 1/8 | 5 1/2 | 6     | 6 1/4 | 6 3/4  | 7      | 7 1/4 | 7 3/4     |
| Scott's regular, fig. 2495       | - set  | \$33 50 | 34 00 | 35 50 | 36 50 | 36 50 | 37 50  | -      | -     | 41 50     |
| Weight, per set                  | - lbs. | 185     | 185   | 200   | 208   | 208   | 210    | -      | -     | 234       |
| Scott's Mannington pattern       | - set  | \$60 00 | 60 00 | -     | 66 00 | 66 00 | 67 00  | -      | -     | -         |
| Weight, per set                  | - lbs. | 388     | 388   | -     | 410   | 410   | 380    | -      | -     | -         |
| Fair's regular, fig. 2499        | - set  | \$33 50 | 34 00 | 35 50 | 36 50 | 36 50 | 37 50  | 41 50  | 41 50 | -         |
| Weight, per set                  | - lbs. | 180     | 180   | 200   | 240   | 240   | 268    | 275    | 275   | -         |
| Fair's Mannington pattern        | - set  | \$60 00 | 60 00 | -     | 66 00 | 66 00 | 67 00  | -      | -     | -         |
| Weight, per set                  | - lbs. | 388     | 388   | -     | 410   | 410   | 380    | -      | -     | -         |
| Fisher's regular, fig. 2503      | - set  | \$33 50 | 34 00 | 35 50 | 36 50 | 36 50 | 37 50  | -      | -     | 41 50     |
| Weight, per set                  | - lbs. | 185     | 185   | 200   | 208   | 208   | 210    | -      | -     | 234       |
| Fisher's Mannington pattern, set | -      | \$60 00 | 60 00 | -     | 66 00 | 66 00 | 67 00  | -      | -     | -         |
| Weight, per set                  | - lbs. | 388     | 388   | -     | 410   | 410   | 380    | -      | -     | -         |
| Size                             | inches | 8       | 8 1/4 | 8 1/2 | 9 1/2 | 10    | 10 1/2 | 11 1/2 | 12    | 14, o. d. |
| Scott's regular, fig. 2495       | - set  | \$43 50 | 43 50 | 45 00 | 48 50 | 52 50 | -      | -      | -     | -         |
| Weight, per set                  | - lbs. | 256     | 256   | 256   | 363   | 386   | -      | -      | -     | -         |
| Scott's Mannington pattern       | - set  | \$71 00 | 71 00 | -     | -     | 94 00 | -      | -      | -     | -         |
| Weight, per set                  | - lbs. | 536     | 536   | -     | -     | 570   | -      | -      | -     | -         |
| Fair's regular, fig. 2499        | - set  | \$43 50 | 43 50 | 45 00 | 48 50 | 52 50 | 57 00  | 58 00  | 98 00 | 122 00    |
| Weight, per set                  | - lbs. | 314     | 314   | 314   | 400   | 400   | 400    | 430    | 540   | 550       |
| Fair's Mannington pattern        | - set  | \$71 00 | 71 00 | -     | -     | -     | -      | -      | -     | -         |
| Weight, per set                  | - lbs. | 536     | 536   | -     | -     | -     | -      | -      | -     | -         |
| Fisher's regular, fig. 2503      | - set  | \$43 50 | 43 50 | 45 00 | 48 50 | 52 50 | -      | -      | -     | -         |
| Weight, per set                  | - lbs. | 256     | 256   | 256   | 363   | 386   | -      | -      | -     | -         |
| Fisher's Mannington pattern, set | -      | \$71 00 | 71 00 | -     | -     | 94 00 | -      | -      | -     | -         |
| Weight, per set                  | - lbs. | 536     | 536   | -     | -     | 570   | -      | -      | -     | -         |

## ELEVATORS—HAND FORGED

| Size                              | inches | 2       | 2 1/4 | 3     | 3 1/4 | 4     | 5 1/2  | 11 1/2 | 12     | 14, o. d. |
|-----------------------------------|--------|---------|-------|-------|-------|-------|--------|--------|--------|-----------|
| Scott's regular, fig. 2495        | - set  | \$55 00 | 34 00 | 42 00 | 43 50 | 46 50 | -      | -      | -      | -         |
| Scott's Mannington pattern        | - set  | -       | -     | 61 50 | -     | 68 50 | 75 00  | -      | -      | -         |
| Fisher's regular, fig. 2503       | - set  | -       | 48 00 | 50 00 | 53 50 | 56 00 | -      | 128 00 | 129 00 | 133 00    |
| Fisher's Mannington, pattern, set | -      | \$64 00 | -     | 79 00 | -     | 94 00 | 102 00 | -      | -      | -         |

Fig. 2502

**ELEVATORS, WROUGHT IRON****FAIR'S PATENT IMPROVED**

Sold in sets of two



| Sizes - - - - inches    | 5       | 5 $\frac{3}{8}$ | 6     | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 8     | 8 $\frac{1}{4}$ |
|-------------------------|---------|-----------------|-------|-----------------|-----------------|-------|-----------------|
| Per set - - - - -       | \$71 00 | 71 00           | 77 00 | 77 00           | -----           | 82 00 | 82 00           |
| Weight, per set, - lbs. | 388     | 388             | 410   | 410             | -----           | 536   | 536             |

**MALLEABLE IRON ELEVATORS****FAIR'S PATENT**

Fig. 2510

**FISHER'S PATENT**

Fig. 2511



Per set of two

| Sizes - - - - - inches              | $\frac{3}{4}$   | 1             | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2               | 2 $\frac{1}{2}$ | 3               |
|-------------------------------------|-----------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Fair's patent, fig. 2510, per set   | \$4 00          | 5 00          | 6 00            | 7 00            | 8 00            | 9 00            | 9 50            |
| Weight, per set - - - - lbs.        | 16              | 15            | 20              | 26              | 40              | 44              | 50              |
| Sizes - - - - - inches              | 3 $\frac{1}{2}$ | 4             | 4 $\frac{1}{2}$ | 5               | 5 $\frac{3}{8}$ | 6 $\frac{1}{4}$ | -----           |
| Fair's patent, fig. 2510, per set   | \$10 00         | 10 50         | 11 00           | 12 00           | 13 00           | 15 00           | -----           |
| Weight, per set - - - - lbs.        | 52              | 56            | 54              | 63              | 68              | 90              | -----           |
| Sizes - - - - - inches              | $\frac{3}{8}$   | $\frac{1}{2}$ | $\frac{3}{4}$   | 1               | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2               |
| Fisher's patent, fig. 2511, per set | \$3 00          | 3 50          | 4 00            | 5 00            | 6 00            | 7 00            | 8 00            |
| Weight, per set - - - - lbs.        | -----           | 10            | 10              | 10              | 15              | 20              | 29              |
| Sizes - - - - - inches              | 2 $\frac{1}{2}$ | 3             | 3 $\frac{1}{2}$ | 4               | 5               | 5 $\frac{3}{8}$ | 6 $\frac{1}{4}$ |
| Fisher's patent, fig. 2511, per set | -----           | \$9 50        | -----           | 10 50           | -----           | 13 00           | 15 00           |
| Weight, per set - - - - lbs.        | -----           | 35            | -----           | 46              | -----           | 60              | 80              |

Fig. 2592

**CASING OR TUBING SWIVEL**

Sometimes used in place of elevators



| Size - inches   | 2               | 3               | 3 $\frac{1}{4}$ | 3 $\frac{1}{2}$ | 4               | 4 $\frac{1}{4}$ | 4 $\frac{1}{2}$ | 5                | 5 $\frac{3}{8}$  | 6 $\frac{1}{4}$ |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|-----------------|
| Price - - - -   | \$7 75          | 8 75            | 8 75            | 9 75            | 10 50           | 10 50           | 11 00           | 12 75            | 13 50            | 14 50           |
| Weight - - lbs. | 7               | 16              | 14              | 18              | 24              | 22              | 28              | 34               | 32               | 46              |
| Size - inches   | 6 $\frac{3}{8}$ | 7 $\frac{1}{4}$ | 7 $\frac{3}{8}$ | 8 $\frac{1}{4}$ | 8 $\frac{3}{8}$ | 9 $\frac{3}{8}$ | 10              | 10 $\frac{3}{8}$ | 11 $\frac{3}{8}$ | -----           |
| Price - - - -   | \$15 00         | 15 50           | 15 50           | 16 75           | 20 00           | 23 00           | 26 50           | 28 50            | 33 00            | -----           |
| Weight - lbs.   | 50              | 58              | 62              | 70              | 78              | 84              | -----           | 90               | 100              | -----           |



ELEVATOR BUSHINGS

FOR FISHER ELEVATOR

Fig. 2509



FOR FAIR OR SCOTT ELEVATOR

Fig. 2507



Per set of 4 pieces

| Size of elevators, inches | Size bushed to, inches | For Fisher elevators, per set | Wt., lbs. | For Fair & Scott elevators, per set | Wt., lbs. | Size of elevators, inches | Size bushed to, inches | For Fisher elevators, per set | Wt., lbs. | For Fair & Scott elevators, per set | Wt., lbs. |
|---------------------------|------------------------|-------------------------------|-----------|-------------------------------------|-----------|---------------------------|------------------------|-------------------------------|-----------|-------------------------------------|-----------|
| 2                         | 1½                     | \$5 50                        | ----      | \$6 25                              | ----      | 7½                        | 5½                     | \$21 00                       | 48        | \$23 00                             | ----      |
| 3                         | 2                      | 7 30                          | ----      | 8 50                                | ----      | 7½                        | 6¼                     | 20 00                         | 40        | 22 00                               | ----      |
| 3                         | 2½                     | 9 00                          | ----      | 9 75                                | ----      | 7½                        | 6½                     | 20 00                         | 42        | 22 00                               | ----      |
| 4                         | 3                      | 11 25                         | ----      | 12 75                               | ----      | 8                         | 6¼                     | 26 25                         | 66        | 27 75                               | ----      |
| 5½                        | 5                      | 14 00                         | 30        | 15 75                               | ----      | 8                         | 6½                     | 26 25                         | 62        | 27 75                               | ----      |
| 5½                        | 4½                     | 17 00                         | ----      | 18 75                               | ----      | 8½                        | 6½                     | 26 25                         | 68        | 27 75                               | ----      |
| 5½                        | 5⅞                     | 14 00                         | 31        | 15 75                               | ----      | 8½                        | 7½                     | 21 50                         | 40        | 23 00                               | ----      |
| 6¼                        | 5                      | 15 25                         | 42        | 16 75                               | ----      | 9½, 10                    | 7½                     | 35 00                         | 120       | 38 25                               | ----      |
| 6¼                        | 5⅞                     | 15 25                         | 38        | 16 75                               | ----      | 9½, 10                    | 8¼                     | 33 00                         | 90        | 34 50                               | ----      |
| 6½                        | 5                      | 15 25                         | 44        | 16 75                               | ----      | 10½                       | 8¼                     | 36 50                         | 110       | 39 50                               | ----      |
| 6½                        | 5⅞                     | 15 25                         | 40        | 16 75                               | ----      | 10½                       | 8½                     | 36 50                         | 106       | 39 50                               | ----      |
| 6½                        | 5½                     | 15 25                         | 25        | 16 75                               | ----      | 11½, 12                   | 9½, 10                 | 53 00                         | ----      | 55 50                               | ----      |
| 6½                        | 6¼                     | 15 25                         | 20        | 16 75                               | ----      | 13 0, D.                  | 10                     | 57 50                         | ----      | ----                                | ----      |

ALL-IRON PULLEY BLOCKS

FOR MANILA OR WIRE LINE

Fig. 2515 Fig. 2517 Fig. 2519



Single Double Triple

PARTS

| Inches | Upper single clevis | Lower single clevis | Upper double clevis | Lower double clevis | Upper triple clevis | Lower triple clevis |
|--------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 24     | \$11 50             | 9 00                | 14 00               | 12 50               | -----               | -----               |
| 26     | 12 50               | 11 50               | 14 00               | 12 50               | -----               | -----               |
| 28     | 15 75               | 12 50               | 15 50               | 14 00               | 17 50               | 16 00               |

ALL-IRON PULLEY BLOCKS, WITHOUT HOOKS

| Size inches | SINGLE         |               | DOUBLE         |               | TRIPLE         |               | QUADRUPLE      |               | WEIGHT, LBS. |        |        |            |
|-------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|--------------|--------|--------|------------|
|             | Regular bushed | Bronze bushed | Regular bushed | Bronze bushed | Regular bushed | Bronze bushed | Regular bushed | Bronze bushed | Single       | Double | Triple | Quad-ruple |
| 22          | \$32 00        | 38 00         | 55 00          | 68 00         | 66 00          | 87 00         | -----          | -----         | 109          | 200    | 310    | ----       |
| 24          | 35 00          | 41 00         | 59 00          | 72 00         | 73 00          | 94 00         | -----          | -----         | 163          | 240    | 350    | ----       |
| 26          | 40 00          | 46 00         | 65 00          | 78 00         | 84 00          | 104 00        | 116 00         | 140 00        | 185          | 280    | 385    | 475        |
| 28          | 45 00          | 51 00         | 74 00          | 87 00         | 90 00          | 111 00        | 143 00         | 167 00        | 245          | 353    | 464    | 580        |

All pulley blocks 22 inches and larger have self-lubricating sheaves.  
When ordering, state whether for Manila or steel rope. The sheaves differ.

## SHEAVES FOR PULLEY BLOCK

Fig. 2521 Fig. 2522



Fig. 2521—FOR MANILA ROPE.

Fig. 2522—FOR WIRE LINE

| Size block for,<br>inches | Diameter of sheave,<br>inches | Weight, lbs. | Price  |
|---------------------------|-------------------------------|--------------|--------|
| 22                        | 11½                           | 35           | \$5 50 |
| 24                        | 13½                           | 48           | 7 25   |
| 26                        | 14¾                           | 52           | 7 50   |
| 28                        | 16¾                           | 72           | 8 00   |

## SNATCH AND PULLEY BLOCKS WITH WOOD CASES

## PRODUCER'S PATTERN

Fig. 2528



Single

Fig. 2530



Double

Fig. 2532



Triple

| Size<br>block,<br>inches | Diameter<br>of<br>sheave,<br>inches | Weight<br>of<br>sheaves,<br>lbs. | REGULAR BLOCKS,<br>LESS HOOKS  |                                |                                | IRON-BOUND BLOCKS,<br>LESS HOOKS |                  |                  | HOOKS               |         |
|--------------------------|-------------------------------------|----------------------------------|--------------------------------|--------------------------------|--------------------------------|----------------------------------|------------------|------------------|---------------------|---------|
|                          |                                     |                                  | Single,<br>Fig. 2528,<br>price | Double,<br>Fig. 2530,<br>price | Triple,<br>Fig. 2532,<br>price | Single,<br>price                 | Double,<br>price | Triple,<br>price | Diameter,<br>inches | Price   |
| 14                       | 7½                                  | 12                               | \$8 00                         | -----                          | -----                          | 9 50                             | -----            | -----            | 1½                  | \$ 4 25 |
| 16                       | 8                                   | 13                               | 8 00                           | -----                          | -----                          | 9 50                             | -----            | -----            | 1¾                  | 4 25    |
| 18                       | 9                                   | 16                               | 8 50                           | -----                          | -----                          | 10 00                            | -----            | -----            | 2                   | 6 00    |
| 20                       | 10                                  | 17                               | 10 00                          | 27 50                          | 41 00                          | 11 50                            | 30 00            | 45 00            | 2½                  | 10 00   |
| 22                       | 11½                                 | 35                               | 16 00                          | 39 00                          | 53 00                          | 17 50                            | 42 00            | 57 00            | 2¾                  | 12 00   |
| 24                       | 13½                                 | 48                               | 20 00                          | 42 50                          | 58 00                          | 21 00                            | 45 00            | 62 00            | 2¾                  | 15 00   |
| 26                       | 14¾                                 | 52                               | 22 50                          | 44 00                          | 62 00                          | 24 00                            | 47 00            | 67 00            | 3                   | 17 50   |
| 28                       | 16¾                                 | 72                               | 34 00                          | 74 00                          | -----                          | 36 00                            | 77 00            | -----            | 3½                  | 30 00   |
| 30                       | ---                                 | -                                | 51 00                          | 98 00                          | -----                          | 53 00                            | -----            | -----            | ---                 | 37 50   |

Extra for buckets - - - - - \$3 00

## WEIGHT OF BLOCKS AND HOOKS

| Size - - - - inches | 14  | 16  | 18  | 20  | 22  | 24  | 26  | 28  | 30  |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Single - - - - lbs. | 42  | 46  | 48  | 56  | 86  | 122 | 140 | 170 | 200 |
| Double - - - - lbs. | 80  | 88  | 94  | 108 | 150 | 200 | 270 | --- | --- |
| Triple - - - - lbs. | 190 | 207 | 220 | 260 | 390 | 540 | 630 | --- | --- |
| Hooks - - - - lbs.  | 21  | 21  | 27  | 55  | 64  | 80  | 95  | 130 | --- |

## PULLEY BLOCK PARTS

| Size - - - - inches         | 14     | 16   | 18   | 20   | 22   | 24   | 26   | 28   | 30   |
|-----------------------------|--------|------|------|------|------|------|------|------|------|
| Steel pin and nut, single - | \$1 00 | 1 00 | 1 25 | 1 25 | 2 50 | 2 75 | 3 00 | 3 50 | 3 75 |
| Steel pin and nut, double - | ----   | ---- | ---- | 2 00 | 3 00 | 3 25 | 3 50 | 4 00 | ---- |
| Steel pin and nut, triple - | ----   | ---- | ---- | ---- | 3 50 | 4 00 | 4 25 | 4 50 | ---- |
| Sheaves - - - - -           | 2 00   | 2 25 | 3 00 | 3 50 | ---- | ---- | ---- | ---- | ---- |
| Sheaves, self-oiling - -    | ----   | ---- | ---- | ---- | 5 50 | 7 25 | 7 50 | 8 00 | 8 50 |
| Latch pins - - - - -        | 50     | 50   | 75   | 75   | 1 00 | 1 00 | 1 00 | 1 00 | ---- |

Fig. 2535

The above steel pins and nuts from 22 to 28 inch inclusive are for either wood case or all iron snatch blocks.



## ROUND IRON SNATCH AND PULLEY BLOCK HOOK—DOUBLE SWIVEL—Fig. 2535

Fig. 2537

| Size iron, round - inches | 3       | 3½    | 4     | 4½    | 5     | 5½    | 6      |
|---------------------------|---------|-------|-------|-------|-------|-------|--------|
| Weight - - lbs.           | 90      | 140   | 170   | 220   | 255   | 340   | 440    |
| Price - - - -             | \$17 50 | 30 00 | 37 50 | 50 00 | 55 00 | 70 00 | 125 00 |



## TUBING HOOK—Fig. 2537

| Size iron, round - - - - inches | 2      | 2½   | 2¾   | 2½   | 2¾   |
|---------------------------------|--------|------|------|------|------|
| Weight - - - - - lbs.           | 20     | 30   | 40   | 50   | 60   |
| Price - - - - -                 | \$3 50 | 4 75 | 5 50 | 6 25 | 8 00 |

## PATTERSON BLOCKS

Not illustrated.

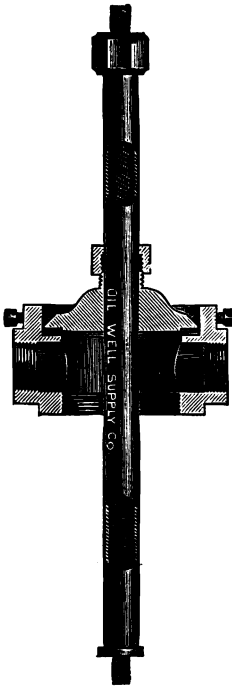
| Size of Block, - - - - inches | PRICE OF BLOCKS ONLY |        |        |
|-------------------------------|----------------------|--------|--------|
|                               | Single               | Double | Triple |
| 18 - - - - -                  | \$15 00              | 34 00  | 39 00  |
| 20 - - - - -                  | -----                | 38 00  | 46 00  |
| 22 - - - - -                  | 19 00                | 42 50  | 53 00  |
| 24 - - - - -                  | 21 00                | 45 00  | 59 00  |
| 26 - - - - -                  | 25 50                | 50 00  | 68 00  |
| 28 - - - - -                  | 30 00                | 55 00  | 75 00  |
| 30 - - - - -                  | 37 00                | 84 00  | 94 00  |

## PATTERSON BLOCK PARTS

| Size of block - - - - inches | 18           | 20     | 22    | 24    | 26    | 28    | 30    |       |
|------------------------------|--------------|--------|-------|-------|-------|-------|-------|-------|
| Shell - - - - -              | { single - - | \$7 00 | ----- | 9 00  | 10 75 | 12 50 | 14 00 | 15 50 |
|                              | { double - - | -----  | 14 50 | ----- | 16 50 | 18 00 | 19 00 | ----- |
|                              | { triple - - | -----  | 18 00 | ----- | 21 00 | 23 00 | 24 00 | ----- |
| Sheave for Manila rope - -   | { single - - | 2 00   | ----- | 3 25  | 4 25  | 4 50  | 5 00  | 6 00  |
|                              | { double - - | -----  | 3 25  | ----- | 4 50  | 5 00  | 6 00  | ----- |
|                              | { triple - - | -----  | 3 25  | ----- | 4 50  | 5 00  | 6 00  | ----- |
| Sheave for wire rope - - -   | { single - - | -----  | ----- | 3 60  | 4 75  | 5 00  | 6 00  | 6 50  |
|                              | { double - - | -----  | 3 60  | ----- | 5 00  | 6 00  | 6 50  | ----- |
|                              | { triple - - | -----  | 3 60  | ----- | 5 00  | 6 00  | 6 50  | ----- |
| Shackle - - - - -            | { double - - | -----  | 5 50  | ----- | 6 50  | 7 50  | 8 00  | ----- |
|                              | { triple - - | -----  | 6 50  | ----- | 7 50  | 8 50  | 9 00  | ----- |
|                              | { double - - | -----  | 80    | ----- | 1 00  | 1 15  | 1 15  | ----- |
| Head bolt- - - - -           | { triple - - | -----  | 90    | ----- | 1 15  | 1 25  | 1 25  | ----- |
|                              | { single - - | 60     | ----- | 70    | 75    | 80    | 1 00  | 1 00  |
|                              | { double - - | -----  | 90    | ----- | 1 00  | 1 10  | 1 10  | ----- |
| Sheave pin and cotter - - -  | { triple - - | -----  | 1 00  | ----- | 1 10  | 1 15  | 1 15  | ----- |
|                              | { single - - | 75     | ----- | 80    | 90    | 1 00  | 1 25  | 1 25  |
|                              | { double - - | -----  | 80    | ----- | 1 00  | 1 25  | 1 25  | ----- |
| Becket - - - - -             | { triple - - | -----  | 80    | ----- | 1 00  | 1 25  | 1 25  | ----- |
|                              | { single - - | 80     | ----- | 90    | 95    | 1 00  | 1 10  | 1 10  |
| Pin and chain - - - - -      | single - -   | 80     | ----- | 90    | 95    | 1 00  | 1 10  | 1 10  |

## PATENT BARREL OIL SAVER AND PARTS

Fig. 2587



For drilling in the oil sand while the well is flowing. The drilling cable is put through the tube and packed with rope yarn. The tube works up and down with the cable through the cap in the casing head. The oil is carried off through the pipes in the sides of the casing head. The cap is fastened to the head by the set screws.

| Size casing head for - - inches | 5%, 6%  | 5%, 6% | 5%, 6% | 6%, 7% | 6%, 7% |
|---------------------------------|---------|--------|--------|--------|--------|
| Size of barrel - - - - inches   | 2½      | 2¾     | 3      | 2½     | 2¾     |
| Weight - - - - lbs.             | 48      | 49     | 55     | 53     | 49     |
| Complete - - - - -              | \$16 50 | 23 00  | 24 00  | 17 00  | 29 00  |
| Base, complete - - - -          | 8 00    | 10 00  | 10 50  | 8 75   | 13 25  |
| Base only - - - - -             | 3 75    | 4 50   | 4 50   | 5 00   | 8 50   |
| Barrel and ring - - - -         | 11 00   | 16 00  | 16 50  | 11 00  | 16 00  |
| Stuffing box - - - - -          | 2 50    | 2 75   | 3 00   | 2 50   | 4 00   |
| Follower - - - - -              | 1 10    | 1 15   | 1 30   | 1 25   | 1 50   |
| Top nut - - - - -               | 1 25    | 1 50   | 2 00   | 1 25   | 1 50   |

| Size casing head for - - inches | 6%, 7%  | 8%    | 8%    | 8%    | .... |
|---------------------------------|---------|-------|-------|-------|------|
| Size of barrel - - - - inches   | 3       | 2½    | 2¾    | 3     | .... |
| Weight - - - - lbs.             | 55      | 53    | 49    | 55    | .... |
| Complete - - - - -              | \$30 00 | 21 50 | 30 50 | 31 00 | .... |
| Base, complete - - - -          | 13 75   | 10 50 | 14 00 | 14 50 | .... |
| Base only - - - - -             | 9 00    | 7 00  | 9 00  | 10 00 | .... |
| Barrel and ring - - - -         | 16 50   | 11 00 | 16 00 | 16 50 | .... |
| Stuffing box - - - - -          | 4 50    | 3 00  | 5 00  | 5 50  | .... |
| Follower - - - - -              | 2 00    | 1 25  | 1 50  | 2 00  | .... |
| Top nut - - - - -               | 2 00    | 1 25  | 1 50  | 2 00  | ..   |

## SAND LINE CAP

FOR MANILA OR WIRE ROPE

Fig. 2585



Fastened in the casing head. The sand pump line is put through it. Used while the well is flowing.

| Size casing head for - - - - inches | 5½     | 6½   | 6¾   | 7¾   | 8½   |
|-------------------------------------|--------|------|------|------|------|
| Price - - - - -                     | \$1 25 | 1 35 | 1 35 | 1 50 | 1 75 |
| Weight - - - - - lbs.               | 14     | 15   | 16   | 18   | 20   |

## NORTHROP OIL SAVER

Fig. 2579



To save the oil when drilling in the oil sand and the well is flowing, or while tubing the well when it is flowing. The rubber disc encircles the cable or tubing tightly, and the oil runs through the pipes in the sides of the casing head, and is conducted to the oil tank.

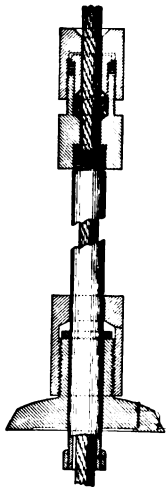
| Size - - - - inches     | 4½      | 4½    | 5     | 5½    | 5½    | 6-P   | 6½    | 6¾    | 7½    | 7¾    | 8½    |
|-------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Weight - - - - lbs.     |         |       |       |       |       |       | 25    |       |       |       | 42    |
| Oil saver only - - -    | \$10 00 | 10 00 | 10 00 | 10 00 | 10 00 | 13 50 | 13 50 | 14 50 | 15 50 | 15 50 | 17 00 |
| Extra rubbers - per set | 2 00    | 2 00  | 2 00  | 2 00  | 2 00  | 2 50  | 2 50  | 2 75  | 3 25  | 3 25  | 4 00  |
| Thumb bolt - - - -      | 50      | 50    | 50    | 50    | 50    | 70    | 70    | 70    | ---   | ---   | ---   |

OIL SAVERS

FOR WIRE LINE

CAIRO PATTERN

Fig. 2588



Weight, 50 lbs.

RIGBY'S PATENT

Fig. 2589



Weight, 30 lbs.

|                                                                |      |         |
|----------------------------------------------------------------|------|---------|
| Cairo Pattern, Fig. 2588 - - - - -                             | each | \$15 00 |
| Rigby's Patent, Fig. 2589, for $\frac{3}{4}$ " wire line - - - | "    | 15 00   |

**CASING DISC****Fig. 2570**

To be attached to the lowest joint of casing and when the casing is lowered in well the water will buoy it up, sustaining a portion of the weight and saving much strain on the screw threads of the couplings. When the casing is in place the disc is broken by dropping a weight in the casing.

|                     |        |      |      |      |      |      |      |
|---------------------|--------|------|------|------|------|------|------|
| Size - - - - inches | 3½     | 4½   | 5    | 5½   | 6½   | 7½   | 8½   |
| Price - - - - -     | \$0 80 | 1 00 | 1 20 | 1 20 | 1 35 | 1 50 | 2 00 |

**CASING TESTER WITH IRON TOP**

Put below the casing and left a few hours, to test if the casing is tight and that no water leaks through.

|                     |        |      |      |      |      |      |      |      |
|---------------------|--------|------|------|------|------|------|------|------|
| Size - - - - inches | 4½     | 5    | 5 ⅜  | 5½   | 6½   | 7½   | 8½   | 8½   |
| Price - - - - -     | \$2 00 | 2 00 | 2 00 | 2 00 | 2 50 | 3 00 | 3 00 | 3 50 |

**Fig. 2596****Fig. 2629****TUBING DISC**

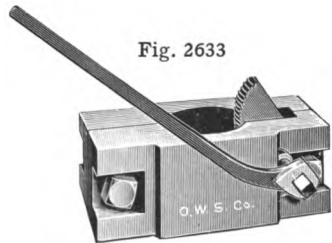
To prevent well flowing while being tubed. The check is put in the tubing above the perforated pipe, see fig. 1362, page 53. When the operation of tubing is complete, the disc, which is of brittle metal, is broken by dropping a weight in the tubing.

|                              |        |      |      |
|------------------------------|--------|------|------|
| Size tubing - - - - - inches | 2      | 2½   | 3    |
| Neath's patent - - - - -     | \$2 00 | 4 50 | 6 75 |
| Extra discs - - - - -        | 25     | 50   | 1 00 |
| Couplings - - - - -          | 1 25   | 3 25 | 4 75 |
| Nipples - - - - -            | 1 25   | 2 00 | 2 75 |

**TUBING CATCHER**

To prevent tubing from dropping while being placed in or removed from well.

|                          |        |      |      |      |
|--------------------------|--------|------|------|------|
| Size - - - - - inches    | 2      | 2    | 3    | 3    |
| Number of dogs - - - - - | 1      | 2    | 1    | 2    |
| Weight - - - - - lbs.    | 50     | 60   | ---  | ---  |
| Price - - - - -          | \$7 00 | 9 00 | 8 00 | 9 00 |
| Dog and bolts - - - each | 3 50   | ---  | ---  | ---  |
| Handles - - - - - each   | 1 00   | 1 00 | 1 25 | 1 25 |

**Fig. 2633****TUBING RING WITH WEDGES**

To suspend tubing from casing head at any desired point without aid of coupling.

**Fig. 1900**

|                              |         |       |       |
|------------------------------|---------|-------|-------|
| Size tubing - - - - - inches | 2       | 2½    | 3     |
| Price - - - - -              | \$18 00 | 22 00 | 26 00 |
| Weight - - - - - lbs.        | 32      | ---   | ---   |

**TUBING BAILER ATTACHMENT****Fig. 2631**

To bail water out of tubing. The bailer is completed by inserting one or more joints of 1-inch pipe between the rope socket end and the coupling. Valve ports open when bailer strikes the bottom, allowing fluid to enter, and close when it is suspended.

|                           |        |      |       |
|---------------------------|--------|------|-------|
| Size - - - - - inches     | 2      | 2½   | 3     |
| Price - - - - -           | \$5 00 | 7 50 | 10 00 |
| Brass valve for - - - - - | 1 00   | 2 50 | 5 00  |



## DRIVE CLAMPS AND WRENCH

Fig. 1920

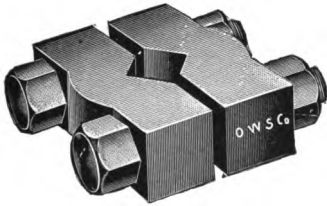


Fig. 1922



| Size drive pipe,<br>inches | Size square on<br>stem, inches | Size of iron,<br>inches | Size of bolts,<br>inches | Weight, lbs. | Clamps only,<br>Fig. 1920 |
|----------------------------|--------------------------------|-------------------------|--------------------------|--------------|---------------------------|
| 5                          | 3½                             | 4 x 4 x 10½             | 2 x 13                   | 115          | \$23 00                   |
| 5½ & 6                     | 3½                             | 4 x 4 x 11½             | 2 x 13                   | 124          | 23 75                     |
| 8                          | 3½                             | 4 x 4 x 12              | 2 x 13                   | 129          | 25 50                     |
|                            | 3½                             | 4½ x 4½ x 14            | 2½ x 14                  | 166          | 28 00                     |
|                            | 3½                             | 4½ x 4½ x 14            | 2½ x 14                  | 166          | 28 00                     |
|                            | 4 & 4½                         | 4½ x 4½ x 14            | 2½ x 15                  | 183          | 29 50                     |
|                            | 4½                             | 5 x 5 x 14              | 2½ x 15                  | 218          | 32 00                     |
| 10                         | 3½                             | 4 x 4 x 16              | 2 x 13                   | 163          | 27 50                     |
|                            | 3½                             | 4½ x 4½ x 16            | 2½ x 14                  | 187          | 29 25                     |
|                            | 3½                             | 4½ x 4½ x 16            | 2½ x 14                  | 187          | 29 25                     |
|                            | 4 & 4½                         | 4½ x 4½ x 16            | 2½ x 15                  | 205          | 30 75                     |
|                            | 4½                             | 5 x 5 x 16              | 2½ x 15                  | 246          | 33 75                     |
| 12                         | 3½                             | 4½ x 4½ x 18            | 2½ x 14                  | 206          | 31 50                     |
|                            | 3½                             | 4½ x 4½ x 18            | 2½ x 14                  | 206          | 31 50                     |
|                            | 4 & 4½                         | 4½ x 4½ x 18            | 2½ x 15                  | 228          | 32 00                     |
|                            | 4½                             | 5 x 5 x 18              | 2½ x 15                  | 274          | 35 25                     |
|                            | 3½ & 3½                        | 4½ x 4½ x 20            | 2½ x 14                  | 226          | 32 50                     |
| 14                         | 4 & 4½                         | 4½ x 4½ x 20            | 2½ x 15                  | 250          | 33 25                     |
|                            | 4½                             | 5 x 5 x 20              | 2½ x 15                  | 301          | 37 00                     |
| 16                         | 4½ & 5                         | 5 x 5 x 22              | 2½ x 17                  | 358          | 58 00                     |
| 18                         | 4½ & 5                         | 5 x 5 x 24              | 2½ x 17                  | 375          | 60 00                     |

|                               |        |         |          |         |         |
|-------------------------------|--------|---------|----------|---------|---------|
| Bolts and nuts - - - - - size | 2 x 13 | 2½ x 14 | 2½ x 14½ | 2½ x 15 | 2½ x 17 |
| Weight - - - - - lbs.         | 23     | 27      | 27.5     | 28      | 37      |
| Price - - - - -               | \$5 75 | 6 00    | 6 25     | 6 50    | 8 00    |

Wrenches, fig. 1922—weight, 20 lbs. - - - - - \$2 75



**O. K. SPUDDING SHOE****Fig. 1543****Weight, 27 pounds****GILLESPIE SPUDDING SHOE****Fig. 1544****Weight, 18 pounds**

O. K. spudding shoe, fig. 1543, complete with spudding arm, fig. 1545 - - - - - \$5 00  
 Gillespie spudding shoe, fig. 1544, complete with spudding arm, fig. 1545 - - - - - 5 00

**WRIST PIN SPUDDING ARM****Fig. 1545****Weight, 25 pounds**

By using the wrist pin spudding arm in connection with fig. 1543 or fig. 1544 the wear on the spudding ropes is decreased.

Wrist pin spudding arm, fig. 1545 - - - - - \$2 00  
 Spudding ring, not illustrated - - - - - 1 00

**NEELY PATENT SPUDDING SHOE**

Not illustrated

**Weight, 28 pounds**

Shoe complete - - - - - \$5 00      Shoe only - - - - - \$3 50  
 Clevis only - - - - - 75      Spool only - - - - - 1 00

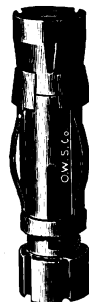
**Fig. 2627****MASSETH TUBING SUPPORTER****Fig. 2625**

Not in common use.

Designed for wells of extreme depth, 3,000 feet or more.

Fig. 2627 is attached to the tubing midway, and rests in the top of fig. 2625.

Fig. 2625 is put in the well midway between top and bottom to take part of the weight of the tubing off the casing head when suspended for pumping.



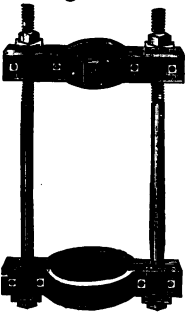
**CASING OR TUBING  
CLAMP****Fig. 2921**

Anchor Clamp, Fig. 2919, is to fasten tubing to derrick sills; to hold down tubing or casing when well is packed with gas packer. Complete with two 1 x 36-inch anchor rods.

MADE OF 1 x 4 INCH IRON

**ANCHOR CLAMP****Fig. 2919**

| Size tubing or casing - inches | 2       | 2½    | 3     | 3½    | 4     | 4½    | 5     | 5½    |
|--------------------------------|---------|-------|-------|-------|-------|-------|-------|-------|
| Fig. 2921 - - - - - price      | \$5 50  | 5 75  | 6 00  | 6 25  | 6 50  | 6 50  | 6 75  | 7 25  |
| Weight - - - - - lbs.          | 60      | 60    | 60    | 62    | 62    | 62    | 63    | 64    |
| Fig. 2919 - - - - - price      | \$11 50 | 11 50 | 11 50 | 11 75 | 11 75 | 11 75 | 12 00 | 12 50 |
| Weight - - - - - lbs.          | 105     | 105   | 105   | 106   | 106   | 106   | 108   | 110   |
| Size tubing or casing - inches | 6¼      | 6½    | 7½    | 8¼    | 9½    | - - - | 11½   | - - - |
| Fig. 2921 - - - - - price      | \$7 75  | 8 00  | 9 00  | 9 50  | 10 50 | - - - | 12 00 | - - - |
| Weight - - - - - lbs.          | 66      | 67    | 70    | 72    | 74    | - - - | 76    | - - - |
| Fig. 2919 - - - - - price      | \$13 00 | 14 00 | 15 00 | 16 00 | 18 00 | - - - | 21 00 | - - - |
| Weight - - - - - lbs.          | 112     | 112   | 114   | 116   | 118   | - - - | 120   | - - - |

**Fig. 2917****ANCHOR CLAMP**

TO ANCHOR TUBING TO DRIVE PIPE OR CASING

To hold tubing in wells where gas pressure exceeds weight of tubing.

MADE OF 1 x 4 INCH IRON—WITH 1 x 36 INCH BOLTS

| Size tubing for - in.         | 2       | 2     | 2     | 2     | 2     | 2     | 2     |
|-------------------------------|---------|-------|-------|-------|-------|-------|-------|
| Size drive pipe or casing for | 4½      | 5     | 5½    | 6¼    | 6½    | 8     | 8¼    |
| Price - - - - -               | \$17 00 | 17 25 | 17 50 | 18 00 | 18 50 | 19 00 | 19 00 |
| Weight - - - lbs.             | 200     | 201   | 202   | 204   | 205   | 208   | 210   |
| Size tubing for - in.         | 3       | 3     | 3     | 3     | 4     | 4     | - - - |
| Size drive pipe or casing for | 6¼      | 6½    | 8¼    | 10    | 6½    | 10    | - - - |
| Price - - - - -               | \$18 25 | 18 75 | 19 50 | 24 00 | 19 00 | 25 00 | - - - |
| Weight - - - lbs.             | 210     | 212   | 214   | 216   | 214   | 220   | - - - |

**ANCHOR BOLTS**

| Size - - - - - inches      | ¾ x 36 | ¾ x 36 | 1 x 36 | ¾ x 40 | ¾ x 40 | 1 x 40 |
|----------------------------|--------|--------|--------|--------|--------|--------|
| Straight - - - - - each    | \$0 55 | .70    | .85    | .60    | .75    | .90    |
| Weight - - - - - lbs.      | 5      | 7      | 9      | 6      | 7½     | 10     |
| With hook on one end, each | - - -  | - - -  | - - -  | \$1 00 | 1 10   | 1 25   |

**Fig. 3216****CASING AND  
TUBING CLAMP**

| Fig. 3216 - - - size, inches | ½      | ¾    | 1    | 2    | 3¼   | 5½   |
|------------------------------|--------|------|------|------|------|------|
| Each - - - - -               | \$2 00 | 2 25 | 2 50 | 3 25 | 4 00 | 6 50 |

**ARNOLD'S TUBING STAY****Fig. 3218**

| Size - - - - - inches | ¾ x 5½ | 1½ x 5½ | 2 x 5½ | 3 x 5½ |
|-----------------------|--------|---------|--------|--------|
| Each - - - - -        | \$1 75 | 1 85    | 2 10   | 2 25   |

**WATER WELL HOOK**

Not illustrated

Price - - - - - \$3 50

COMMON CASING HEADS

TWO-WAY  
Fig. 2542



One-hole top  
TWO-WAY  
Fig. 2557



With side outlet for 2½  
or 3 inch tubing

TWO-WAY  
Fig. 2547



Two-hole top

FOUR-WAY  
Fig. 2545



One-hole top

| Size - - - - - inches          | 3¼     | 4¼    | 4½    | 5       | 5⅜    |
|--------------------------------|--------|-------|-------|---------|-------|
| Two-way with 1-hole top - - -  | \$2 50 | 2 50  | 2 50  | 3 00    | 3 00  |
| Two-way with 2-hole top - - -  | 3 00   | 3 00  | 3 00  | 3 50    | 3 50  |
| Weight - - - - - lbs.          | 36     | 36    | 36    | 40      | 40    |
| Four-way with 1-hole top - - - | -----  | ----- | ----- | \$4 25  | 4 25  |
| Four-way with 2-hole top - - - | -----  | ----- | ----- | 4 75    | 4 75  |
| Weight - - - - - lbs.          | -----  | ----- | ----- | 44      | 44    |
| Two-way, fig. 2557 - - -       | -----  | ----- | ----- | \$10 00 | 10 00 |
| Weight - - - - - lbs.          | -----  | ----- | ----- | 66      | 66    |

| Size - - - - - inches          | 5%     | 6 pipe | 6¼    | 6%    | 7%    | 8¼    | 8%    | 9%    | 10    | 10%   | 11%   | 12    |
|--------------------------------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Two-way with 1-hole top - - -  | \$3 00 | 3 40   | 3 40  | 4 25  | 6 00  | 9 50  | 13 00 | 19 00 | 21 00 | 22 50 | 25 00 | 27 00 |
| Two-way with 2-hole top - - -  | 3 50   | 3 90   | 3 90  | 4 75  | 6 50  | 10 00 | 13 50 | 19 75 | 22 00 | 23 25 | 25 75 | 28 00 |
| Weight - - - - - lbs.          | 40     | 44     | 44    | 44    | 59    | 92    | 93    | 99    | 101   | 101   | 129   | ----- |
| Four-way with 1-hole top - - - | 4 25   | 5 00   | 5 00  | 6 00  | 8 00  | 12 00 | 17 00 | 24 00 | 26 00 | 27 50 | 30 00 | 33 00 |
| Four-way with 2-hole top - - - | 4 75   | 5 50   | 5 50  | 6 50  | 8 50  | 12 50 | ----- | ----- | ----- | ----- | ----- | ----- |
| Weight - - - - - lbs.          | 44     | 47     | 47    | 47    | 67    | 95    | ----- | ----- | ----- | ----- | ----- | ----- |
| Two-way, fig. 2557 - - -       | 10 00  | 11 50  | 11 50 | 13 00 | 15 00 | 18 00 | ----- | ----- | ----- | ----- | ----- | ----- |
| Weight - - - - - lbs.          | 66     | 99     | 99    | 99    | 100   | 101   | ----- | ----- | ----- | ----- | ----- | ----- |

CHICKERING CASING  
HEAD  
Fig. 2561



BERRY CASING  
HEAD  
Fig. 2563



COMMON TEE CASING  
HEAD  
Fig. 2573



| Size - - - - - inches                                 | 4¼     | 4½    | 5      | 5⅜   | 5½   | 6 p  | 6¼   | 6½    | 7¼    | 7½    | 8¼    |
|-------------------------------------------------------|--------|-------|--------|------|------|------|------|-------|-------|-------|-------|
| Two-way, fig. 2561 or 2563<br>with 4 set screws - - - | \$6 00 | 6 00  | 6 00   | 6 00 | 5 50 | 8 00 | 8 00 | 9 00  | 9 50  | 9 50  | 12 50 |
| Weight - - - - - lbs.                                 | 44     | 44    | 46     | 46   | 46   | 54   | 54   | 70    | 74    | 78    | 97    |
| Four-way with 4 set screws -                          | \$7 00 | 7 00  | 7 00   | 7 00 | 7 00 | 9 00 | 9 00 | 10 00 | 10 50 | 10 50 | 13 50 |
| Weight - - - - - lbs.                                 | 48     | 48    | 48     | 50   | 50   | 59   | 59   | 76    | 79    | 84    | 101   |
| Common tee, fig. 2573 - - -                           | -----  | ----- | \$5 25 | 5 25 | 5 25 | 7 00 | 7 00 | 9 00  | ----- | 12 00 | 16 00 |
| Weight - - - - - lbs.                                 | -----  | ----- | 66     | 66   | 66   | 78   | 78   | 84    | ----- | ----- | ----- |

## ARMOR CASING HEAD TOP

Fig. 2559



| Size casing head for - inches | 5 $\frac{3}{8}$ | 6 $\frac{1}{4}$ | 5 $\frac{1}{2}$ | 6 $\frac{1}{4}$ |
|-------------------------------|-----------------|-----------------|-----------------|-----------------|
| Size tubing for - - inches    | 2               | 2               | 3               | 3               |
| Tops, complete - - - -        | \$7 00          | 7 00            | 10 00           | 10 00           |
| Tops, complete less rubber -  | 4 00            | 4 00            | 6 00            | 6 00            |
| Rings only - - - - -          | 50              | 50              | 75              | 75              |
| Covers only - - - - -         | 1 50            | 1 50            | 2 00            | 2 00            |
| Rubbers only - - - - -        | 3 00            | 3 00            | 4 00            | 4 00            |
| Center flanges - - - - -      | 1 00            | 1 00            | 1 50            | 1 50            |
| Bases - - - - -               | 1 50            | 1 50            | 2 00            | 2 00            |
| Studs - - - - -               | 30              | 30              | 30              | 30              |

## AJAX CASING HEAD TOPS

Fig. 2553



For tubing and  
steam pipe

Derricks are often blown down, causing the tubing to break off and drop in the hole. This has been a source of great annoyance and expense, and can be avoided by the use of our safety casing head tops. They are so made that the tubing will break off above the coupling.

Fig. 2555



For tubing only

| Size - - - - inches | TOPS                      |                           |                           |                           | RINGS       |             |                           |             |                         |
|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------|-------------|---------------------------|-------------|-------------------------|
|                     | 5 $\frac{3}{8}$<br>1-hole | 5 $\frac{3}{8}$<br>2-hole | 6 $\frac{1}{4}$<br>1-hole | 6 $\frac{1}{4}$<br>2-hole | 2<br>1-hole | 2<br>2-hole | 1 $\frac{1}{2}$<br>2-hole | 1<br>2-hole | $\frac{3}{4}$<br>2-hole |
| Weight - - - - lbs. | 13                        | 13                        | 16                        | 16                        | 12          | 12          | 12                        | 5           | 5                       |
| Price - - - - -     | \$2 50                    | 2 75                      | 3 00                      | 3 25                      | 1 25        | 1 25        | 1 25                      | 75          | 75                      |

## CASING HEAD TOPS AND RINGS

Not illustrated

| Size head for    -    inches     | 2 $\frac{3}{4}$ | 3 $\frac{1}{4}$ , 4 $\frac{1}{4}$ ,<br>5, 5 $\frac{5}{8}$ | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 7 $\frac{5}{8}$ | 8, 8 $\frac{1}{4}$ ,<br>8 $\frac{3}{8}$ | 9 $\frac{3}{8}$ | 10 $\frac{3}{8}$ | 11 $\frac{3}{8}$ |
|----------------------------------|-----------------|-----------------------------------------------------------|-----------------|-----------------|-----------------|-----------------------------------------|-----------------|------------------|------------------|
| Tops, regular - - - - -          | \$0 75          | 75                                                        | 1 00            | 1 25            | 1 50            | 2 00                                    | 2 50            | 3 00             | 3 50             |
| With two and one inch hole       | 1 00            | 1 00                                                      | 1 25            | 1 50            | 1 75            | 2 25                                    | 3 00            | 3 50             | 4 00             |
| Rings, regular two-inch -        | 30              | 30                                                        | 30              | 30              | 30              | 30                                      | 30              | 30               | 30               |
| <b>Weight</b> - - - - - lbs.     | <b>3</b>        | <b>9</b>                                                  | <b>11</b>       | <b>11</b>       | <b>11</b>       | <b>16-24</b>                            | <b>24</b>       | <b>27</b>        | <b>42</b>        |
| Rings, size - - - - - inches     |                 |                                                           |                 |                 |                 | 1 $\frac{1}{4}$                         | 2 $\frac{1}{2}$ | 3 and 4          |                  |
| Price - - - - -                  |                 |                                                           |                 |                 |                 | \$0 30                                  | 40              | 50               |                  |
| Tops, size tubing - - - - -      |                 |                                                           |                 |                 |                 | 2 $\frac{1}{2}$ , 3 or 4 inch           |                 |                  |                  |
| Tops, size casing head - - - - - |                 |                                                           |                 |                 |                 | 5, 5 $\frac{5}{8}$                      | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$  |                  |
| Price - - - - -                  |                 |                                                           |                 |                 |                 | \$0 75                                  | 1 00            | 1 25             |                  |

## RINGS FOR TWO-HOLE TOPS

| Rings, size - - - - - inches | $\frac{3}{4}$ and 1 inch | 2-inch |
|------------------------------|--------------------------|--------|
| Price - - - - -              | \$0 25                   | 30     |

## THE HAYES PATENT CASING HEAD

WITH TUBULAR EXTENSION

Fig. 2580



Fig. 2580A



Is attached by sliding the extension tube into the Casing; no special threaded nipple is required. "Bell over" the top of Casing with hammer, wrap a little hemp packing around the tubular extension of Casing Head, slide into casing and the curved shoulder of Casing Head will rest on the "belled over" top and make a tight and satisfactory joint.

### PRICE

| Size inches | With Regular Top | With Ajax Safety Top |
|-------------|------------------|----------------------|
| 5           | \$3 25           | \$3 75               |
| 5½          | 3 25             | 3 75                 |
| 6¼          | 4 00             | 4 50                 |

Weights: 5", 41 lbs.; 5½ and 6¼", 43 lbs.

## THE KIRSCHNER TUBING TOP

PATENTED JUNE 9, 1903

Fig 2581



Length, 4 feet.

The Kirschner Tubing Top is solid wrought metal. There is no thread or joint where the upper end rests on the casing head.

Constant vibration from pumping weakens the ordinary coupling joint at the casing head. Fires expand the coupling and wind storms blow down derricks; from these and other causes tubing is frequently dropped in the well.

The Kirschner Tubing Top is designed to prevent such losses.

|                               |                |        |
|-------------------------------|----------------|--------|
| Regular weight, 2-inch        | - each         | \$7 00 |
| Heavy, for deep wells, 2-inch | - - - - - each | 7 50   |

**WROUGHT IRON CASING HEAD TOPS**

| Size casing head for, inches | 5 $\frac{1}{8}$ | 5 $\frac{3}{8}$ | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 7 $\frac{1}{8}$ | 8 $\frac{1}{4}$ | 8 $\frac{3}{8}$ | 9    | 9 $\frac{1}{8}$ |
|------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------|-----------------|
| Price - - - - -              | \$2 00          | 2 00            | 2 25            | 2 25            | 2 35            | 2 50            | 2 50            | 2 75 | 2 75            |

**WROUGHT IRON CASING HEAD RINGS**

| Size tubing or casing for - - - inches | 2      | 2 $\frac{1}{2}$ | 3    | 3 $\frac{1}{4}$ | 3 $\frac{1}{2}$ | 4    | 4 $\frac{1}{2}$ |
|----------------------------------------|--------|-----------------|------|-----------------|-----------------|------|-----------------|
| Price - - - - -                        | \$1 00 | 1 00            | 1 15 | 1 15            | 1 25            | 1 25 | 1 50            |

**CASING HEAD SET SCREWS**

| Size casing head for, inches | 5      | 5 $\frac{1}{8}$ | 5 $\frac{3}{8}$ | 6 p | 6 $\frac{1}{4}$ | 6 $\frac{3}{8}$ | 7 $\frac{1}{4}$ | 7 $\frac{3}{8}$ | 8 $\frac{1}{4}$ |
|------------------------------|--------|-----------------|-----------------|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
| Price - - - - -              | \$0 15 | 15              | 15              | 15  | 15              | 15              | 15              | 15              | 15              |

**WOLF'S SAFETY CASING CAP**

Fig. 2565



For 5 $\frac{3}{8}$ -inch casing - - - - - price, \$2 50  
 For 6 $\frac{1}{4}$ -inch casing - - - - - price, 2 50

**STUFFING BOX CASING HEADS**

Fig. 2575

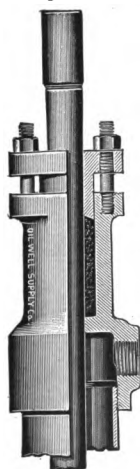
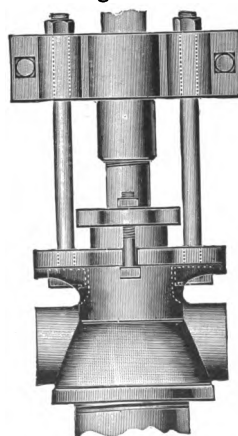


Fig. 2574 can be used with anchor as shown in illustration; or without when gas pressure is not sufficient to raise tubing.

| Sizes for - - - - } | 5 in. casing                | 5 $\frac{3}{8}$ in. casing  | 6 $\frac{1}{4}$ -in. casing |
|---------------------|-----------------------------|-----------------------------|-----------------------------|
| Fig. 2575 - - - -   | \$20 00                     | 22 50                       | 25 00                       |
| Weight - - - lbs.   | 98                          | 98                          | 160                         |
| Fig. 2574 - - - -   | -----                       | \$15 00                     | 16 00                       |
| Weight - - - lbs.   | -----                       | -----                       | -----                       |
| Sizes for - - - - } | 6 $\frac{3}{8}$ -in. casing | 8 $\frac{1}{4}$ -in. casing | 10-in. pipe                 |
| Fig. 2575 - - - -   | \$27 50                     | 30 00                       | 32 50                       |
| Weight - - - lbs.   | 160                         | 198                         | 245                         |
| Fig. 2574 - - - -   | -----                       | -----                       | -----                       |
| Weight - - - lbs.   | -----                       | -----                       | -----                       |

Fig. 2574

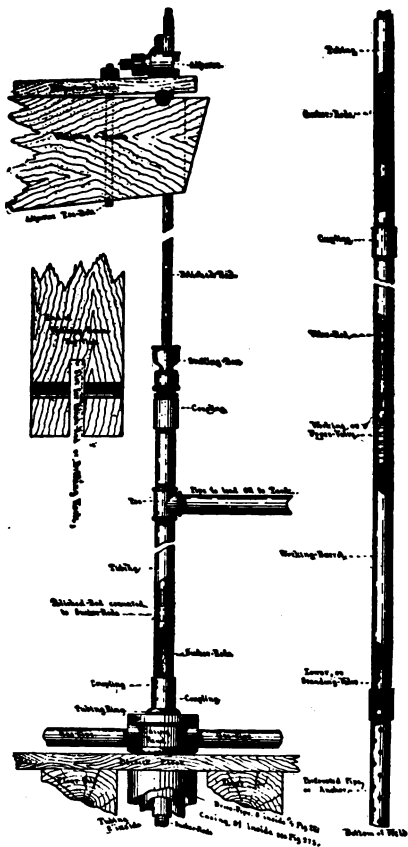


Patented

PUMPING OUTFITS

SHOWING EVERYTHING USED IN PUMPING AN OIL WELL, AND HOW THE PARTS ARE CONNECTED

Fig. 1375



A regular pumping outfit consists of the following:  
Adjuster.                      Set of valves.  
Adjuster board.              Stuffing box.  
Adjuster T bolt.              Working barrel.  
Polished rod.                Three feet perforated pipe.  
Substitute.                  Valve rod.  
For prices see under various headings.

ADJUSTER—LITTLE GIANT

Fig. 2640



Malleable iron—weight, 9 lbs.   - - - - \$3 00  
Cast iron—weight, 15 lbs.   - - - - 3 00

LEWIS OR LOCKE ADJUSTER

LEWIS

Fig. 2642



LOCKE

Fig. 2644



Adjuster for 1½ polished rod   - - - - \$6 00  
Adjuster for 1¼ polished rod   - - - - 6 00  
Adjuster for 1½ polished rod   - - - - 10 50  
Extra plug for Lewis or Locke   - - - - 2 50  
Castings for Lewis or Locke   - - - - 4 50

Weight, each, 30 pounds.

BOLTED ADJUSTER

Fig. 2646

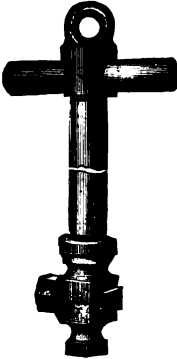


|                   |        |        |       |       |
|-------------------|--------|--------|-------|-------|
| Size polished rod | inches | 1 1/8  | 1 1/4 | 1 1/2 |
| Price             |        | \$3 00 | 10 00 | 12 00 |

Weight, 13 pounds.

## GRIP ADJUSTERS AND PARTS

**SINGLE**  
**Fig. 2648**



**Weight, 34 lbs.**

**DOUBLE**  
**Fig. 2650**



**Weight, 52 lbs.**

**WRENCH**  
**Fig. 2651**



**Weight, 10 lbs.**

|                                                           |           |                   |
|-----------------------------------------------------------|-----------|-------------------|
| For size of polished rod                                  | - - - - - | inches, 1½ and 1¾ |
| Single, complete, fig. 2648                               | - - - - - | \$6 00            |
| Double, complete, fig. 2650                               | - - - - - | 7 00              |
| Crosshead, only                                           | - - - - - | 2 00              |
| Single lower part, complete                               | - - - - - | 3 50              |
| Double lower part, complete                               | - - - - - | 4 00              |
| Plug and nut                                              | - - - - - | 1 50              |
| Wrench                                                    | - - - - - | 2 50              |
| Malleable swivel                                          | - - - - - | 1 00              |
| Collar                                                    | - - - - - | 35                |
| Lock nut                                                  | - - - - - | 25                |
| Grip pipes, 2 inch x 8 foot; weight, 29 lbs.              | - - - - - | 3 00              |
| Grip pipes, 2 inch x 8 foot; extra heavy, weight, 40 lbs. | - - - - - | 5 00              |

**ADJUSTER BOARD**  
**Fig. 2659**



|          |   |   |   |   |         |
|----------|---|---|---|---|---------|
| Weight - | - | - | - | - | 12 lbs. |
| Price    | - | - | - | - | \$0 40  |

**ADJUSTER T BOLT**  
**Fig. 2663**



| Size of bolt - inches | $\frac{7}{8}$ | 1    | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
|-----------------------|---------------|------|----------------|----------------|
| Weight - - - lbs.     | 5             | 7    | 9              | 12             |
| Price - - - -         | \$1 00        | 1 50 | 2 00           | 2 50           |
| Extra washers -       | 15            | 20   | 25             | 40             |

**Fig. 2671**



### ELEVATOR SUBSTITUTE

|                            |                 |                 |                 |                 |                 |
|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Size of rod for - - inches | 1 $\frac{5}{8}$ | 1 $\frac{7}{8}$ | 2 $\frac{1}{4}$ | 2 $\frac{1}{2}$ | 3 $\frac{1}{2}$ |
| Size of box - - - inches   | $\frac{7}{8}$   | 1               | 1 $\frac{1}{8}$ | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ |
| Price - - - - -            | \$0 60          | 75              | 1 40            | 1 50            | 2 75            |



Fig. 2657

## POLISHED ROD

| Diameter, inches | Length, feet | Size pin, inches        | Size box, inches | Size sucker rod for, inches | Weight, lbs. | Price  |
|------------------|--------------|-------------------------|------------------|-----------------------------|--------------|--------|
| $\frac{5}{8}$    | 11           | $\frac{5}{8}$           | $\frac{5}{8}$    | $\frac{1}{2}$ iron          | 12           | \$3 30 |
| $\frac{3}{4}$    | 11           | $\frac{3}{4}$           | $\frac{3}{4}$    | $\frac{1}{8}$ wood          | 17           | 3 60   |
| 1                | 11           | 1                       | 1                | $\frac{1}{8}$ wood          | 30           | 4 00   |
| $1\frac{1}{8}$   | 6            | $\frac{7}{8}$           | $\frac{7}{8}$    | $\frac{1}{8}$ wood          | 22           | 3 60   |
| $1\frac{1}{8}$   | 8            | $\frac{7}{8}$           | $\frac{7}{8}$    | $\frac{1}{8}$ wood          | 28           | 4 10   |
| $1\frac{1}{8}$   | 5            | with eye<br>with swivel | $\frac{7}{8}$    | $\frac{1}{8}$ wood          | 18           | 5 25   |
| $1\frac{1}{8}$   | 5            |                         | $\frac{7}{8}$    | $\frac{1}{8}$ wood          | 19           | 5 75   |
| $1\frac{1}{8}$   | 11           |                         | $\frac{7}{8}$    | $\frac{1}{8}$ wood          | 37           | 5 10   |
| $1\frac{1}{8}$   | 11           | $\frac{7}{8}$           | 1                | $\frac{1}{8}$ wood          | 37           | 5 20   |
| $1\frac{1}{8}$   | 11           | 1                       | 1                | $\frac{1}{8}$ wood          | 37           | 5 20   |
| $1\frac{1}{8}$   | 16           | $1\frac{1}{8}$          | $1\frac{1}{8}$   | $2\frac{1}{4}$ wood         | 55           | 8 00   |
| $1\frac{1}{8}$   | 15           | $\frac{7}{8}$           | $\frac{7}{8}$    | $1\frac{5}{8}$ wood         | 51           | 6 80   |
| $1\frac{1}{8}$   | 10           | $1\frac{1}{8}$          | $1\frac{1}{8}$   | $2\frac{1}{4}$ wood         | 34           | 6 50   |
| $1\frac{1}{8}$   | 16           | $\frac{7}{8}$           | $\frac{7}{8}$    | $1\frac{5}{8}$ wood         | 55           | 7 40   |
| $1\frac{1}{8}$   | 11           | $1\frac{1}{8}$          | $1\frac{1}{8}$   | $2\frac{1}{4}$ wood         | 38           | 6 70   |
| $1\frac{1}{4}$   | 11           | $\frac{7}{8}$           | $\frac{7}{8}$    | $1\frac{5}{8}$ wood         | 46           | 6 60   |
| $1\frac{1}{4}$   | 11           | 1                       | 1                | $1\frac{5}{8}$ wood         | 46           | 6 85   |
| $1\frac{1}{4}$   | 11           | $1\frac{1}{8}$          | $1\frac{1}{8}$   | $2\frac{1}{4}$ wood         | 47           | 7 85   |
| $1\frac{1}{4}$   | 11           | $1\frac{1}{4}$          | $1\frac{1}{4}$   | $2\frac{1}{4}$ wood         | 47           | 7 90   |
| $1\frac{1}{4}$   | 8            | $\frac{7}{8}$           | $\frac{7}{8}$    | $1\frac{5}{8}$ wood         | 34           | 5 00   |
| $1\frac{1}{2}$   | 16           | $1\frac{1}{2}$          | $1\frac{1}{2}$   | $3\frac{1}{2}$ wood         | 97           | 14 00  |
| $1\frac{1}{2}$   | 11           | $1\frac{1}{2}$          | $1\frac{1}{2}$   | $3\frac{1}{2}$ wood         | 67           | 12 00  |

For  $1\frac{1}{8}$ -inch brass casing polished rods, add to above list - - - - - \$4 00

For  $1\frac{1}{4}$ -inch brass casing polished rods, add to above list - - - - - 5 00

For  $1\frac{1}{8}$ -inch brass casing polished rods with 2-inch stuffing box, add to above list - - - - - 6 00

For  $1\frac{1}{4}$ -inch brass casing polished rods with 2-inch stuffing box, add to above list - - - - - 7 00

Eyes for  $1\frac{1}{8}$ -inch polished rods - - - - - 1 40

$\frac{7}{8}$ -inch polished rod boxes - - - - - 40

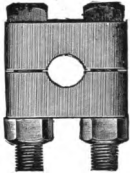
## VALVE ROD

Fig. 2661

To connect the lower end of the sucker rods to the working valve

| Size valves for, inches      | Size of box, inches | Size of pin, inches | Size rods for, inches | Weight, lbs. | Price  |
|------------------------------|---------------------|---------------------|-----------------------|--------------|--------|
| $1\frac{1}{4}$               | $\frac{3}{4}$       | $\frac{7}{8}$       | $\frac{1}{8}$ iron    | ----         | \$1 00 |
| $1\frac{1}{4}$               | $\frac{3}{4}$       | $\frac{7}{8}$       | $\frac{1}{8}$ wood    | 7            | 1 00   |
| $1\frac{1}{4}$               | $\frac{3}{4}$       | 1                   | $\frac{1}{8}$ wood    | ----         | 1 25   |
| $2\frac{1}{4}, 2\frac{3}{4}$ | $\frac{3}{4}$       | $\frac{7}{8}$       | $\frac{1}{8}$ wood    | 9.5          | 1 50   |
| $2\frac{1}{4}, 2\frac{3}{4}$ | $\frac{3}{4}$       | 1                   | $\frac{1}{8}$ wood    | 9.5          | 1 75   |
| $2\frac{1}{4}, 2\frac{3}{4}$ | $\frac{3}{4}$       | $1\frac{1}{8}$      | $2\frac{1}{4}$ wood   | 13.5         | 2 50   |
| $2\frac{1}{4}, 2\frac{3}{4}$ | $\frac{3}{4}$       | $1\frac{1}{4}$      | $2\frac{1}{4}$ heavy  | 13.5         | 3 00   |
| $3\frac{1}{4}$               | 1                   | $\frac{7}{8}$       | $1\frac{5}{8}$        | 17           | 1 50   |
| $3\frac{1}{4}$               | 1                   | 1                   | $1\frac{5}{8}$        | 17           | 1 85   |
| $3\frac{1}{4}$               | 1                   | $1\frac{1}{8}$      | $2\frac{1}{4}$        | 17           | 3 00   |
| Size valves for, inches      | Size of box, inches | Size of pin, inches | Size rods for, inches | Weight, lbs. | Price  |
| $3\frac{1}{4}$               | 1                   | $1\frac{1}{4}$      | $2\frac{1}{4}$ heavy  | 17           | \$3 25 |
| $3\frac{1}{4}$               | $1\frac{1}{4}$      | 1                   | $2\frac{1}{4}$ heavy  | 17           | 3 25   |
| $3\frac{1}{4}$               | $1\frac{1}{4}$      | $1\frac{5}{8}$      | $2\frac{1}{4}$        | 22           | 3 50   |
| $3\frac{1}{4}$               | $1\frac{1}{4}$      | $1\frac{1}{4}$      | $2\frac{1}{4}$ heavy  | 22           | 3 75   |
| $4\frac{1}{4}, 4\frac{3}{4}$ | $1\frac{1}{4}$      | $1\frac{5}{8}$      | $2\frac{1}{4}$        | 22.5         | 3 50   |
| $4\frac{1}{4}, 4\frac{3}{4}$ | $1\frac{1}{4}$      | $1\frac{1}{4}$      | $2\frac{1}{4}$ heavy  | 22.5         | 3 75   |
| $4\frac{1}{4}, 4\frac{3}{4}$ | $1\frac{1}{4}$      | $1\frac{5}{8}$      | $3\frac{1}{2}$        | 25           | 6 00   |
| $5\frac{1}{4}, 5\frac{3}{4}$ | $1\frac{1}{2}$      | $1\frac{5}{8}$      | $2\frac{1}{4}$        | 33           | 6 00   |
| $5\frac{1}{4}, 5\frac{3}{4}$ | $1\frac{1}{2}$      | $1\frac{1}{4}$      | $2\frac{1}{4}$ heavy  | 34           | 6 00   |
| $5\frac{1}{4}, 5\frac{3}{4}$ | $1\frac{1}{2}$      | $1\frac{5}{8}$      | $3\frac{1}{2}$        | 35           | 6 25   |

Fig. 2658

**POLISHED ROD CLAMPS**

|                                                       |        |        |     |
|-------------------------------------------------------|--------|--------|-----|
| Size - - - - -                                        | inches | 1½     | 1¾  |
| Price - - - - -                                       |        | \$0 60 | 60  |
| Weight - - - - -                                      | lbs.   | 5      | 5.5 |
| Polished Rod Grip, "C"-Pattern - - - - - each, \$3 00 |        |        |     |

**SUBSTITUTES**

For connecting sucker rods, polished rods, valve rods, or valves of different sizes of threads

**SUCKER-ROD SUBS**

Not illustrated

| BOX          |        | PIN          |        | Price  | BOX          |        | PIN          |        | Price  |
|--------------|--------|--------------|--------|--------|--------------|--------|--------------|--------|--------|
| Size, inches | Thread | Size, inches | Thread |        | Size, inches | Thread | Size, inches | Thread |        |
| 7/8          | 10     | 1            | 10     | \$0 40 | 1 5/8        | 10     | 7/8          | 10     | \$0 50 |
| 1            | 10     | 7/8          | 10     | 40     | 1            | 10     | 1 5/8        | 10     | 50     |
| 7/8          | 10     | 1 1/8        | 10     | 40     | 1 5/8        | 10     | 1            | 10     | 50     |
| 1 1/8        | 10     | 7/8          | 10     | 40     | 1            | 10     | 1 1/8        | 8      | 50     |
| 1            | 10     | 1 1/8        | 10     | 40     | 1 1/8        | 8      | 1            | 10     | 50     |
| 1 1/8        | 10     | 1            | 10     | 40     | 1 1/8        | 8      | 1 1/4        | 8      | 60     |
| 7/8          | 10     | 1 5/8        | 10     | 50     | 1 1/4        | 8      | 1 1/8        | 8      | 60     |

**VALVE SUBS**

Not illustrated

|                                              |           |        |
|----------------------------------------------|-----------|--------|
| 1/2-inch pipe box, 1 1/8-inch, 10-thread pin | - - - - - | \$0 15 |
| 3/4-inch pipe box, 1 1/8-inch, 10-thread pin | - - - - - | 15     |
| 1/2-inch pipe box, 1 5/8-inch, 10-thread pin | - - - - - | 25     |
| 3/4-inch pipe box, 1 5/8-inch, 10-thread pin | - - - - - | 25     |

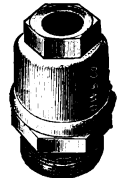
Fig. 2665



With bowl

**BRASS STUFFING BOXES**

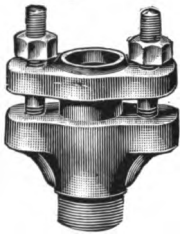
Fig. 2667



Without bowl

|                            |        |       |       |       |       |         |
|----------------------------|--------|-------|-------|-------|-------|---------|
| Size polished rod - inches | 5/8    | 7/8   | 1 1/8 | 1 1/2 | 1 3/4 | 1 7/8   |
| Size tubing - - - - -      | 1 1/4  | 2     | 2     | 2 1/2 | 3     | 2       |
| Weight - - - - - lbs.      | - - -  | - - - | 5     | 7     | 10    | 5       |
| Complete - - - - -         | \$1 75 | 2 00  | 2 00  | 3 50  | 4 25  | 2 25    |
| Upper parts - - - - -      | - - -  | - - - | 1 00  | 1 25  | - - - | 1 25    |
| Lower parts - - - - -      | - - -  | - - - | 1 00  | 1 25  | - - - | 1 25    |
| Followers - - - - -        | - - -  | - - - | 25    | 30    | - - - | 35      |
| Size polished rod - inches | 1 1/4  | 1 1/2 | 1 3/4 | 1 7/8 | 2     | 2 1/4   |
| Size tubing - - - - -      | 2 1/2  | 3     | 3 1/2 | 4     | 4     | 5 and 6 |
| Weight - - - - - lbs.      | 7      | 10    | - - - | - - - | - - - | - - -   |
| Complete - - - - -         | \$3 50 | 4 25  | 4 75  | 5 00  | 7 00  | 10 00   |
| Upper parts - - - - -      | 1 50   | - - - | - - - | - - - | - - - | - - -   |
| Lower parts - - - - -      | 1 50   | - - - | - - - | - - - | - - - | - - -   |
| Followers - - - - -        | 40     | - - - | - - - | - - - | - - - | - - -   |

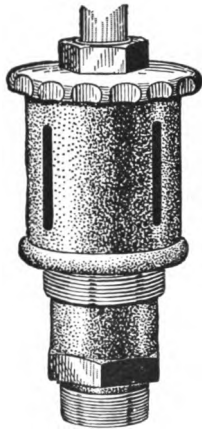
Fig. 2669



## IRON FLANGED STUFFING BOX

| Size polished rod, inches | 1½     | 1½   | 1½   | 1½   | 1½   | 1½   |
|---------------------------|--------|------|------|------|------|------|
| Size tubing - - inches    | 2      | 2½   | 3    | 2    | 2½   | 3    |
| Weight - - - lbs.         | 11     | 12   | 13   | 11   | 12   | 13   |
| Complete - - - -          | \$2 75 | 3 25 | 3 75 | 2 75 | 3 25 | 3 75 |
| Upper part - - - -        | 1 25   | 1 50 | 1 75 | 1 25 | 1 50 | 1 75 |
| Lower part - - - -        | 1 75   | 2 00 | 2 35 | 1 75 | 2 00 | 2 35 |

Fig. 2664



## SUPERIOR STUFFING BOX

AUTOMATIC ADJUSTMENT

Patented

| Size polished rod, inches | 1½     | 1½   | 1½   | 1½   | 1½   | 1½   |
|---------------------------|--------|------|------|------|------|------|
| Size tubing - - inches    | 2      | 2½   | 3    | 2    | 2½   | 3    |
| Weight - - - lbs.         | 13     | 16   | 18   | 13   | 16   | 18   |
| Complete - - - -          | \$3 00 | 3 50 | 4 00 | 3 00 | 3 50 | 4 00 |
| Upper part or bowl - -    | 2 00   | 2 25 | 2 50 | 2 00 | 2 25 | 2 50 |
| Lower part or bowl - -    | 1 50   | 1 75 | 2 00 | 1 50 | 1 75 | 2 00 |
| Follower - - - -          | 60     | 60   | 60   | 60   | 60   | 60   |
| Springs, ¼ inch - - -     | 30     | ---  | ---  | ---  | ---  | ---  |
| Springs, ⅜ inch - - -     | ---    | 40   | 40   | 40   | 40   | 40   |

## STEEL WORKING BARRELS

| Size tubing for, in. | Inside diam., inches | Outside diam., inches | Gauge | Length tube, ft. in. | Length barrel, ft. in. | Weight per ft., lbs. | Length stroke, inches | Capacity per stroke, gallons | Weight, lbs. | Price  |
|----------------------|----------------------|-----------------------|-------|----------------------|------------------------|----------------------|-----------------------|------------------------------|--------------|--------|
| 1½                   | 1½                   | 1¾                    | --    | 4 6                  | 4 8                    | 2                    | 42                    | .18                          | 13½          | \$8 00 |
| 1½                   | 1½                   | 1¾                    | --    | 5 0                  | 5 2                    | 2                    | 48                    | .20                          | 14½          | 8 25   |
| 1½                   | 1½                   | 1¾                    | --    | 5 0                  | 5 3                    | 2.8                  | 42                    | .27                          | 11           | 8 50   |
| 2                    | 1¾                   | 2                     | --    | 5 2                  | 5 6                    | 3.3                  | 39                    | .43                          | 24           | 9 00   |
| 2                    | 1¾                   | 2                     | --    | 5 4                  | 5 8                    | 3.3                  | 41                    | .45                          | 25           | 9 25   |
| 2                    | 1¾                   | 2                     | --    | 5 6                  | 5 10                   | 3.3                  | 43                    | .47                          | 25           | 9 50   |
| 2                    | 1¾                   | 2                     | --    | 5 8                  | 6 0                    | 3.3                  | 45                    | .50                          | 26           | 9 75   |
| 2                    | 1¾                   | 2                     | --    | 5 10                 | 6 2                    | 3.3                  | 47                    | .52                          | 27           | 10 00  |
| 2                    | 1¾                   | 2                     | --    | 6 0                  | 6 4                    | 3.3                  | 49                    | .59                          | 29           | 10 25  |
| 2                    | 1¾                   | 2                     | --    | 7 0                  | 7 4                    | 3.3                  | 60                    | .66                          | 32           | 10 50  |
| 2                    | 1¾                   | 2                     | --    | 5 2                  | 5 6                    | 4.77                 | 39                    | .43                          | 30           | 10 50  |
| 2                    | 1¾                   | 2                     | --    | 5 4                  | 5 8                    | 4.77                 | 41                    | .45                          | 31           | 10 75  |
| 2                    | 1¾                   | 2                     | --    | 5 6                  | 5 10                   | 4.77                 | 43                    | .47                          | 32           | 10 75  |
| 2                    | 1¾                   | 2                     | --    | 5 8                  | 6 0                    | 4.77                 | 45                    | .50                          | 33           | 11 00  |
| 2                    | 1¾                   | 2                     | --    | 5 10                 | 6 2                    | 4.77                 | 47                    | .52                          | 34           | 11 25  |
| 2                    | 1¾                   | 2                     | --    | 6 0                  | 6 4                    | 4.77                 | 49                    | .59                          | 35           | 11 75  |
| 2                    | 1¾                   | 2                     | --    | 7 0                  | 7 4                    | 4.77                 | 60                    | .66                          | 38           | 13 00  |
| 2½                   | 2½                   | 2¾                    | --    | 5 0                  | 5 4                    | 3.8                  | 39                    | .67                          | 43           | 22 00  |
| 2½                   | 2½                   | 2¾                    | --    | 5 6                  | 5 10                   | 3.8                  | 45                    | .77                          | 45           | 24 00  |
| 2½                   | 2½                   | 2¾                    | --    | 6 0                  | 6 4                    | 3.8                  | 50                    | .86                          | 47           | 26 00  |
| 2½                   | 2½                   | 2¾                    | --    | 6 6                  | 6 10                   | 3.8                  | 56                    | .96                          | 49           | 28 00  |
| 2½                   | 2½                   | 2¾                    | --    | 7 0                  | 7 4                    | 3.8                  | 62                    | 1.06                         | 51           | 30 00  |
| 3                    | 2¾                   | 3½                    | --    | 5 0                  | 5 4                    | 8                    | 39                    | 1.00                         | 56           | 25 00  |
| 3                    | 2¾                   | 3½                    | --    | 5 6                  | 5 10                   | 8                    | 45                    | 1.15                         | 60           | 26 50  |
| 3                    | 2¾                   | 3½                    | --    | 6 0                  | 6 4                    | 8                    | 50                    | 1.28                         | 64           | 28 00  |
| 3                    | 2¾                   | 3½                    | --    | 6 6                  | 6 10                   | 8                    | 56                    | 1.43                         | 68           | 29 50  |
| 3                    | 2¾                   | 3½                    | --    | 7 0                  | 7 4                    | 8                    | 62                    | 1.59                         | 72           | 31 00  |

**CAST IRON WORKING  
BARREL**

| Size of tubing, inches | Inside diameter of barrels, inches | Weight, lbs. | Without valves |
|------------------------|------------------------------------|--------------|----------------|
| 2                      | 1½                                 | 46           | \$9 00         |
| 2                      | 1¾                                 | 50           | 9 00           |
| 2½                     | 2¼                                 | 64           | 18 00          |

**LOWER COUPLING AND  
SEAT FOR WORKING  
BARREL****MALLEABLE IRON**

| Size - inches | 1¾     | 2¼   |
|---------------|--------|------|
| Price - - -   | \$0 85 | 1 65 |

**WORKING BARREL COUPLING AND SEAT****WROUGHT IRON**

| Size - - - - inches     | 2      | 2½   | 3    | 3½   | 4    | 4½   | 5    | 5½   | 6     |
|-------------------------|--------|------|------|------|------|------|------|------|-------|
| Upper couplings - - - - | \$0 50 | 1 25 | 2 50 | 2 75 | 3 50 | 5 25 | 6 50 | 7 50 | 8 50  |
| Lower seat - - - - -    | 75     | 1 50 | 3 00 | 3 25 | 4 00 | 6 00 | 7 50 | 9 00 | 10 00 |

**INSERTED WORKING BARRELS, PLUNGERS, ETC.**

Inserted working barrels are used where the regular working barrel is worn out. They are lowered into the well with the sucker rods, and when properly seated in the barrel are ready for operation.

**ROUGH AND READY**

Fig. 2726

OIL WELL  
SUPPLY CO.'S  
Fig. 2720

With brass tube, 1½ in. l. d. x 1½ in. o. d. x 3 ft. 6 in. - - - - \$13 00  
With steel tube (Evans), 1½ in. l. d. x 1½ in. o. d. x 4 ft. 2 in. - - - - 12 50



Weight, 17 lbs.

LEWIS  
Fig. 2722

With steel tube, 1½ in. x 1¾ in. x 3 ft. 8 in. - - - - \$14 00  
With brass tube, 1½ in. x 1¾ in. x 3 ft. 8 in. - - - - 15 00



Weight, 18 lbs.

With steel tube, 1½ in. x 1½ in. x 4 ft. 6 in. - - - - \$15 00



Weight, 20 lbs.

DARLING  
Fig. 2724

With steel tube, 1½ in. x 1½ in. x 4 ft. 6 in. - - - - \$20 00  
With brass tube, 1½ in. x 1½ in. x 4 ft. 6 in. - - - - 22 00



Weight, 20 lbs.

BRUNDRED  
PLUNGER  
Fig. 2728

Furnished loose fit for C. I. workings barrels - - - - \$12 00



Weight, 18 lbs.

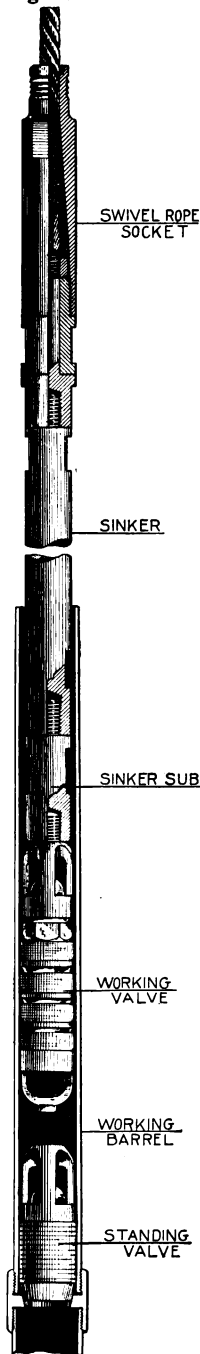
Brass plunger

Steel tube

The advantage of the Brundred plunger is that the standing valve is removed with the rods. Used in standard cast iron working barrels only.

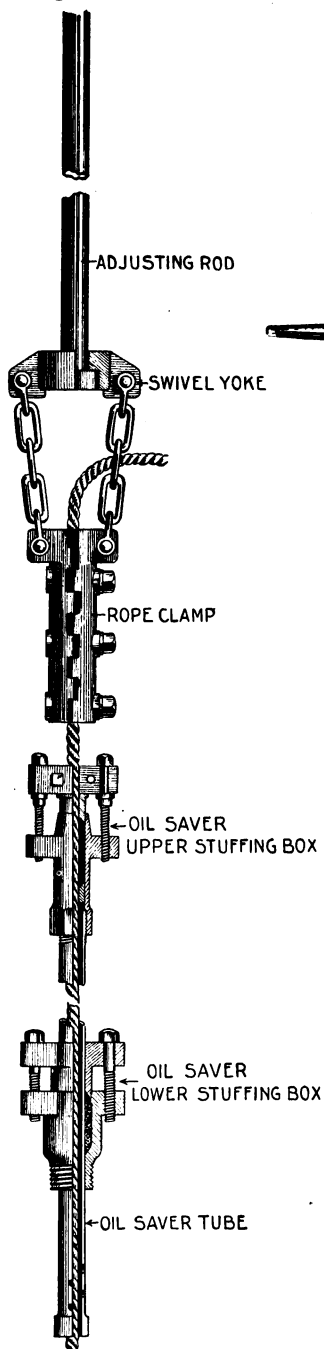
# LESCHEN'S WIRE LINE OIL PUMPS

"STANDARD"  
PUMP  
Fig. 2716



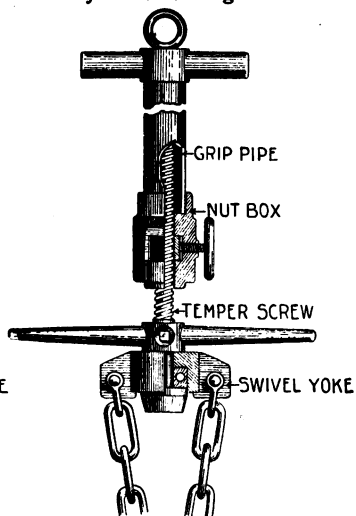
With Adjusting Rod.  
Fig. 2717

Patent applied for. For description and lists see next page.



## UPPER CONNECTIONS

With Temper Screw  
Adjustment. Fig. 2718



Patent applied for

## LESCHEN WIRE LINE OIL PUMPS

The Leschen Wire Line Pump, Fig. 2716, is operated with a wire line in the place of the ordinary wood or iron sucker rods.

The pump is of simple construction and is suitable to any well where a regular 2-inch pumping outfit can be used.

The sinkers connecting the traveling valve and the wire line may be made of non-magnetic metal. The sinkers are from 9 to 31 feet in length and can be run into the derrick without unjointing when the valve is pulled to replace cups.

---

### Leschen's "Standard" Wire Line Pump - - - - - \$60 00

Consisting of the following: (see Figs. 2716 and 2717):

|                                                                          |       |
|--------------------------------------------------------------------------|-------|
| 1 adjusting rod (with swivel yoke, chains and rope hanger) - - - - -     | 6 50  |
| 1 rope clamp - - - - -                                                   | 9 00  |
| 1 oil saver, complete - - - - -                                          | 19 00 |
| 1 swivel rope socket - - - - -                                           | 10 00 |
| 2 iron sinkers, each 15½ ft. long, weight 90 lbs., each \$7 00 - - - - - | 14 00 |
| 1 sinker sub (to connect sinker to working valve) - - - - -              | 1 50  |

---

### Leschen's "Non-Magnetic" Wire Line Pump - - - - - \$68 50

Consisting of the following (see Figs. 2716 and 2717):

|                                                                      |       |
|----------------------------------------------------------------------|-------|
| 1 adjusting rod (with swivel yoke, chains and rope hanger) - - - - - | 6 50  |
| 1 rope clamp - - - - -                                               | 9 00  |
| 1 oil saver, complete - - - - -                                      | 19 00 |
| 1 swivel rope socket - - - - -                                       | 10 00 |
| 1 "Non-Magnetic" sinker (9 ft. long, weight 90 lbs.) - - - - -       | 22 00 |
| 1 sinker sub (to connect sinker to rope socket) - - - - -            | 2 00  |

The items in both "Standard" and "Non-Magnetic" pumps as shown in above lists include sinkers. These are sufficient only in wells producing high gravity oil. To obtain proper results in heavier oil more sinkers should be used.

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NOTE—With the above outfits either regular Working Barrel Valves, (see page 228), or an O. W. S. Co. (Evans), or a Rough & Ready inserted Working Barrel (see page 219) may be used. For list price on these items see pages referred to.

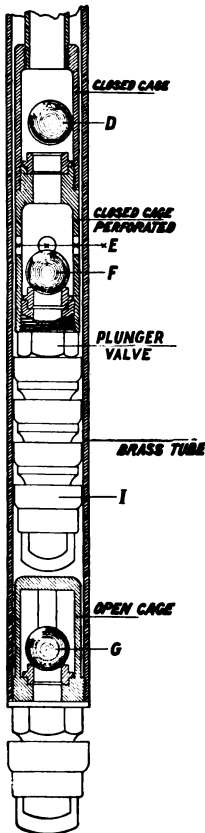
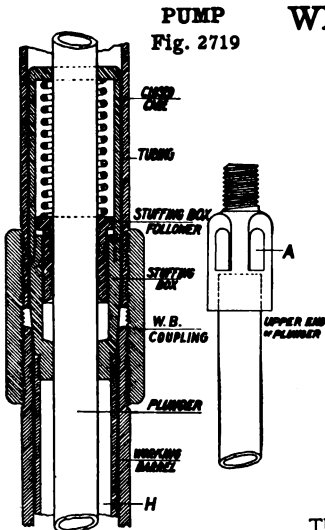
A Grip Adjuster is also necessary for either outfit; for list price see page 215.

## UPPER CONNECTIONS

The upper connections may be provided with a **Temper Screw Adjustment** (see Fig. 2718), by which the position of the valve may be regulated from the derrick floor.

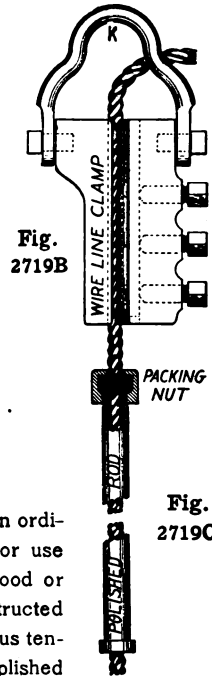
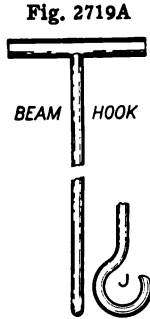
Price, less Grip Pipe and Cross Head - - - - - \$22 50

For list price on Grip Pipe and Cross Head see page 215.



# WIRE LINE PUMP

TAYLOR PATENT



This pump is made to fit or work in an ordinary working barrel, and is designed for use with wire rope instead of the regular wood or iron sucker rods. The pump is constructed with the view of maintaining a continuous tension on the wire rope. This is accomplished in the following manner: Starting with the plunger at the lower limit of the stroke, the oil is drawn by the up-stroke into the pump through the valve "G," and at the completion of the up-stroke the space between the bottom of the plunger and the valve "G" will be filled with oil. As the tubing above the pump fills with fluid, there will be a pressure on the top of the plunger equivalent to the pressure of the fluid in pounds per square inch, multiplied by the sectional area of the plunger, less the sectional area of the rope. This pressure is utilized in maintaining the tension of the wire rope and returning the plunger on the down-stroke. On the downward passage of the plunger the oil which has been drawn through valve "G" is passed up past "I" and "F" through the holes "E" and into the annular space "H" between the plunger and the working barrel. On the following up-stroke of the plunger, the oil in "H" is forced back through holes "E" past the valve "D," and thence through the hollow plunger "A" into the tubing.

NOTE.—It is customary to use one iron sucker rod of ordinary length between lower end of pumping line and plunger valve.

The special equipment consists of the pump, fig. 2719; walking beam hook, fig. 2719A; wire line clamp, fig. 2719B, and the hollow polished rod for 2-inch tubing, fig. 2719C.

Price, complete - - - - - \$50 00

## O'DELL PUMPING OUTFIT

This outfit is designed for use in gas wells for pumping water or oil which sometimes interferes with the free flow of gas.

The Working Barrel, Fig. 2732, may be lowered to the bottom of the tubing and held in place by the Anchor, or a common working barrel may be used and the Liner, Fig. 2731, inserted therein.

In either case the remainder of outfit would consist of  $\frac{3}{4}$ " special tubing, which would take the place of ordinary sucker rods, and the attachments for connecting to walking beam either of Standard Rig or Klein Pumping Power.

As the fluid to be pumped is forced up through the hollow rods, a portion of the polished rod is also hollow to permit the discharge of fluid.

Itemized list of parts as follows:

### OUTFIT FOR WALKING BEAM

- 1 Anchor
- 1 Perforated Pipe
- 1 O'Dell Barrel complete
- 1 Hollow Polished Rod
- 1 Brass Knuckle Joint
- 1 Solid Iron Polished Rod
- 1 Little Giant Adjuster
- 1 Iron Stuffing Box
- 1 Check Valve
- 1 Tee Bolt and Washer
- 1 Adjuster Board.

Outfit complete for Walking Beam - - - \$50 00

Weight, 130 lbs.

### OUTFIT FOR KLEIN POWER

Same as for Walking Beam, except that the Tee Bolt, Washer, Adjuster Board and Adjuster are not required.

Outfit complete for Klein Power - - - \$47 00

Weight, 100 lbs.

NOTE.—The above prices do not include the  $\frac{3}{4}$ " special tubing.

Fig. 2732

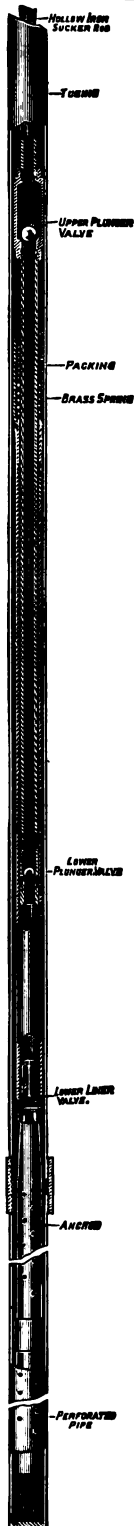
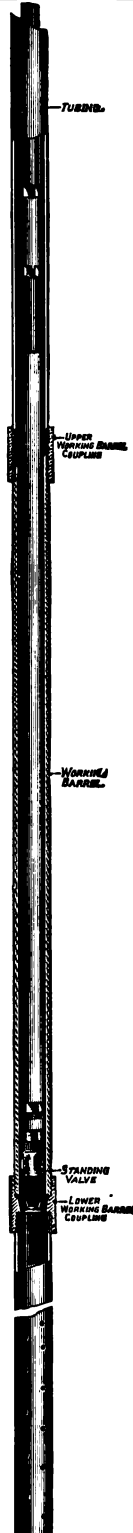


Fig. 2731





# BRASS WORKING BARREL OR DEEP WELL PUMP

WITH BALL VALVES

Fig. 2691



Our working barrels are made of heavy seamless drawn brass tubing, and are perfectly smooth and true.

The inside diameter of the barrels is smaller than that of the tubing or casing with which they are used, to allow for removing the valves by drawing them up through the tubing when in need of repairs.

The standing or lower valve is packed with leather rings, the working or upper valve with cup-shaped leathers.

For convenience in ordering, we publish in the table herewith the size of tubing, the inside diameter of barrel, the length of stroke; also the capacity in gallons per stroke. Taking the number of strokes per minute, the capacity for any given time can be determined.

| Size of tubing, inches | Inside diameter barrel, inches | Outside diameter barrel, inches | Length of barrel, inches | Length of stroke, inches | Capacity per stroke, gallons | Weight, lbs.   | Complete with valves | Without valves |
|------------------------|--------------------------------|---------------------------------|--------------------------|--------------------------|------------------------------|----------------|----------------------|----------------|
| 1                      | $\frac{7}{8}$                  | $1\frac{1}{8}$                  | 48                       | 36                       | .09                          | $7\frac{1}{2}$ | \$13 20              | 9 00           |
| $1\frac{1}{4}$         | $1\frac{1}{8}$                 | $1\frac{3}{8}$                  | 48                       | 42                       | .18                          | 9              | 14 20                | 10 00          |
| $1\frac{1}{2}$         | $1\frac{3}{8}$                 | $1\frac{5}{8}$                  | 42                       | 24                       | .15                          | 10             | 15 60                | 10 50          |
| $1\frac{1}{2}$         | $1\frac{3}{8}$                 | $1\frac{5}{8}$                  | 60                       | 42                       | .27                          | 13             | 16 10                | 11 00          |
| 2                      | $1\frac{11}{16}$               | $2\frac{1}{16}$                 | 39 s. s.                 | 24                       | .26                          | 10             | 14 00                | 9 00           |
| 2                      | $1\frac{11}{16}$               | $2\frac{1}{16}$                 | 60                       | 39                       | .43                          | 14             | 18 00                | 13 00          |
| 2                      | $1\frac{11}{16}$               | $2\frac{1}{16}$                 | 42 s. s.                 | 24                       | .27                          | 20             | 20 00                | 15 00          |
| 2                      | $1\frac{11}{16}$               | $2\frac{1}{16}$                 | 48                       | 36                       | .40                          | 23             | 22 00                | 17 00          |
| 2                      | $1\frac{11}{16}$               | $2\frac{1}{16}$                 | 60                       | 42                       | .46                          | 28             | 24 00                | 19 00          |
| $2\frac{1}{2}$         | $2\frac{1}{4}$                 | $2\frac{3}{4}$                  | 30 s. s.                 | 18                       | .30                          | 27             | 33 50                | 22 50          |
| $2\frac{1}{2}$         | $2\frac{1}{4}$                 | $2\frac{3}{4}$                  | 36 s. s.                 | 18                       | .30                          | 32             | 34 25                | 23 25          |
| $2\frac{1}{2}$         | $2\frac{1}{4}$                 | $2\frac{3}{4}$                  | 42                       | 24                       | .41                          | 37             | 37 00                | 24 00          |
| $2\frac{1}{2}$         | $2\frac{1}{4}$                 | $2\frac{3}{4}$                  | 60                       | 42                       | .72                          | 44             | 39 50                | 26 50          |
| $2\frac{1}{2}$         | $2\frac{1}{4}$                 | $2\frac{3}{4}$                  | 84                       | 64                       | 1.10                         | 59             | 42 00                | 29 00          |
| 3 or $3\frac{1}{4}$    | $2\frac{3}{4}$                 | $3\frac{1}{4}$                  | 30 s. s.                 | 18                       | .46                          | 33             | 43 00                | 29 00          |
| 3 or $3\frac{1}{4}$    | $2\frac{3}{4}$                 | $3\frac{1}{4}$                  | 42                       | 24                       | .61                          | 47             | 47 50                | 31 00          |
| 3 or $3\frac{1}{4}$    | $2\frac{3}{4}$                 | $3\frac{1}{4}$                  | 60                       | 42                       | 1.07                         | 56             | 51 00                | 34 50          |
| 3 or $3\frac{1}{4}$    | $2\frac{3}{4}$                 | $3\frac{1}{4}$                  | 84                       | 64                       | 1.64                         | 74             | 55 00                | 38 50          |
| 3 or $3\frac{1}{4}$    | $2\frac{3}{4}$                 | $3\frac{1}{4}$                  | 96                       | 76                       | 1.95                         | 105            | 56 50                | 40 00          |
| $3\frac{1}{2}$         | $3\frac{1}{4}$                 | $3\frac{3}{4}$                  | 36 s. s.                 | 18                       | .64                          | 40             | 60 50                | 38 00          |
| $3\frac{1}{2}$         | $3\frac{1}{4}$                 | $3\frac{3}{4}$                  | 60                       | 42                       | 1.50                         | 60             | 68 00                | 42 00          |
| $3\frac{1}{2}$         | $3\frac{1}{4}$                 | $3\frac{3}{4}$                  | 84                       | 64                       | 2.30                         | 80             | 72 00                | 46 00          |
| 4 or $4\frac{1}{4}$    | $3\frac{3}{4}$                 | $4\frac{1}{4}$                  | 48 s. s.                 | 36                       | 1.72                         | 59             | 74 50                | 44 00          |
| 4 or $4\frac{1}{4}$    | $3\frac{3}{4}$                 | $4\frac{1}{4}$                  | 60                       | 42                       | 2.00                         | 70             | 76 50                | 46 00          |
| 4 or $4\frac{1}{4}$    | $3\frac{3}{4}$                 | $4\frac{1}{4}$                  | 66                       | 42                       | 2.00                         | 72             | 77 50                | 47 00          |
| 4 or $4\frac{1}{4}$    | $3\frac{3}{4}$                 | $4\frac{1}{4}$                  | 84                       | 64                       | 3.06                         | 90             | 80 50                | 50 00          |
| $4\frac{1}{2}$         | $4\frac{1}{4}$                 | $4\frac{3}{4}$                  | 48 s. s.                 | 36                       | 2.21                         | ---            | 106 50               | 60 00          |
| $4\frac{1}{2}$         | $4\frac{1}{4}$                 | $4\frac{3}{4}$                  | 66                       | 42                       | 2.58                         | ---            | 110 50               | 64 00          |
| 5                      | $4\frac{3}{4}$                 | $5\frac{1}{4}$                  | 48 s. s.                 | 36                       | 2.76                         | 88             | 130 00               | 79 00          |
| 5                      | $4\frac{3}{4}$                 | $5\frac{1}{4}$                  | 66                       | 42                       | 3.22                         | 110            | 134 00               | 83 00          |
| $5\frac{5}{8}$         | $5\frac{1}{4}$                 | $5\frac{3}{4}$                  | 66                       | 42                       | 3.94                         | 120            | 173 00               | 104 00         |
| $5\frac{5}{8}$         | $5\frac{1}{4}$                 | $5\frac{3}{4}$                  | 72                       | 45                       | 4.21                         | 131            | 175 00               | 106 00         |
| 6                      | $5\frac{3}{4}$                 | $6\frac{1}{4}$                  | 54 s. s.                 | 36                       | 4.04                         | 108            | 203 00               | 118 00         |
| 6                      | $5\frac{3}{4}$                 | $6\frac{1}{4}$                  | 72                       | 45                       | 5.06                         | 132            | 209 00               | 124 00         |
| 6                      | $5\frac{3}{4}$                 | $6\frac{1}{4}$                  | 96                       | 76                       | 8.54                         | 175            | 217 00               | 132 00         |

NOTE.—S. S. after length of barrel indicates short stroke barrels

## WORKING BARRELS

BRASS LINED

Not illustrated

|                                                                          |           |          |
|--------------------------------------------------------------------------|-----------|----------|
| 7 $\frac{1}{4}$ inches x 8 $\frac{1}{4}$ inches x 8 feet, with valves    | - - - - - | \$600 00 |
| 6 $\frac{3}{4}$ inches x 7 $\frac{1}{4}$ inches x 8 feet, without valves | - - - - - | 350 00   |

## PLUNGER WORKING BARRELS

SNOW'S PATENT

Fig. 2694



PLAIN PLUNGER

Fig. 2697



SNOW'S PATENT—Fig. 2694

|                                      |           |         |
|--------------------------------------|-----------|---------|
| For 2-inch tubing, weight, 72 pounds | - - - - - | \$20 00 |
| For 2 $\frac{1}{2}$ -inch tubing     | - - - - - | 45 00   |
| For 3-inch tubing                    | - - - - - | 60 00   |

PLAIN PLUNGER—Fig. 2697

|                                            |           |         |
|--------------------------------------------|-----------|---------|
| For 2-inch tubing, with plain plunger      | - - - - - | \$25 00 |
| For 2-inch tubing, with corrugated plunger | - - - - - | 26 00   |

Weight, 64 pounds.

## PARTS FOR 2-INCH PLUNGER WORKING BARRELS

|                       |           |        |
|-----------------------|-----------|--------|
| Diaphragms            | - - - - - | \$8 00 |
| Plungers, complete    | - - - - - | 8 00   |
| Bottoms               | - - - - - | 2 00   |
| Standing valves       | - - - - - | 2 10   |
| Upper plunger valves  | - - - - - | 2 00   |
| Lower plunger valves  | - - - - - | 1 75   |
| Plungers, less valves | - - - - - | 5 00   |
| Upper valve cages     | - - - - - | 1 25   |
| Standing valve cages  | - - - - - | 1 00   |
| Balls                 | - - - - - | 35     |
| Seats                 | - - - - - | 75     |
| Leathers              | - - - - - | 75     |
| Pipes                 | - - - - - | 1 50   |

## PERFORATED PIPE

Fig. 2675



|                 |           |        |        |                 |      |                 |       |
|-----------------|-----------|--------|--------|-----------------|------|-----------------|-------|
| Size            | - - - - - | inches | 2      | 2 $\frac{1}{2}$ | 3    | 3 $\frac{1}{2}$ | 4     |
| Weight per foot | - - - - - | lbs.   | 3.61   | 5.74            | 7.54 | 9               | 10.66 |
| Per foot        | - - - - - |        | \$0 50 | 75              | 1 00 | 1 15            | 1 25  |

## WORKING BARREL SCREEN AND REMOVABLE WELL LINER

Fig. 2734



The oil-producing formation in many wells is of a soft, friable nature, which gradually crumbles and fills the lower part of the well, thus diminishing the production and in many instances cutting it off entirely.

This has been overcome by inserting a perforated liner of suitable length to cover the producing area or "pay streak." The loose sand gradually works through the perforations and fills the space occupied by the working barrel, and the only remedy is to withdraw the tubing and clean the well. The cleaning process is retarded and only imperfectly accomplished by reason of the reduced diameter of the well resulting from the use of the liner.

Fig. 2734 represents a device which accomplishes the desired result of screening the oil before it reaches the valves, and is so constructed that it is readily withdrawn with the tubing, thus permitting the use of "cleaning out" tools of full size of the well.

### DESCRIPTION

A.—Short piece of tubing of suitable length to pass between sustaining point D and admit tubing elevator between upper B and F.

B. B.—The tubing coupling on either end of A, forming a jar or knocker, by which the entire device may be jarred loose in event of sand settling and sticking it in the well.

C.—Upper portion of the body or screen, usually not perforated.

D. D.—Couplings of the screen, which is usually made about twenty-eight feet in length.

E.—Lower end of screen, perforated to admit oil and shut out the loose caving sand; this lower end is made with a projectile point to permit the easy withdrawal from well after sand has settled around it.

G.—Showing location of working barrel inside of screen.

F.—Upper part of screen, made of heavy forging. This is made of suitable size for easy passage of the tubing, and lower end has shoulder resting on upper end of C, which sustains the weight of the device.

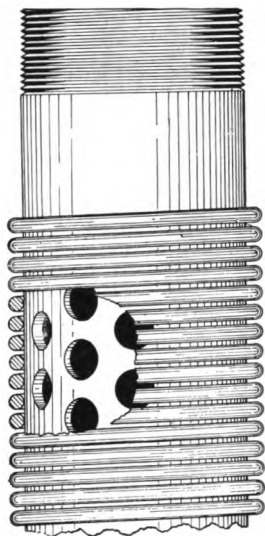
H.—Perforated pipe attached below the working barrel.

**Weight, 285 lbs.**

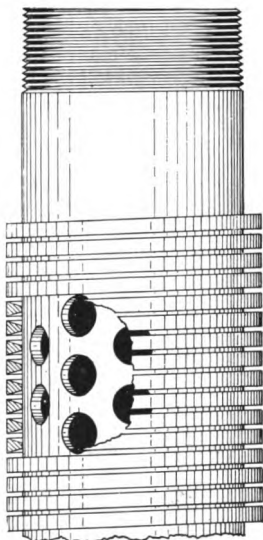
Prices on application.

## STRAINERS

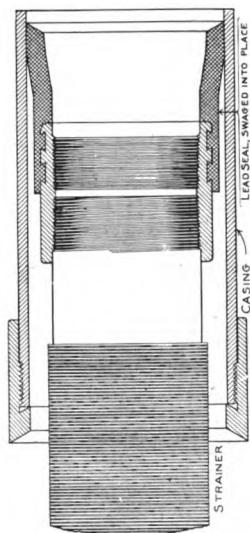
**Fig. 2221**



**Fig. 2222**



**Fig. 2223**

[illegible]

## WORKING BARREL VALVES

WITH STEEL OR BRASS SEATS

**UPPER OR  
WORKING BRASS  
VALVE**  
Fig. 2735



**LOWER OR  
STANDING BRASS  
VALVE**  
Fig. 2737



**FOUR-CUP  
UPPER STEEL  
VALVE**  
Fig. 2747



**LOWER  
STEEL  
VALVE**  
Fig. 2745



### BRASS VALVES

| Size of tubing - in.            | 1      | 1½   | 1½   | 2    | 2    | 2½    | 3     | 3½    | 4     | 4½    | 5     | 5½    | 6     |
|---------------------------------|--------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Inside diameter of barrel - in. | 7/8    | 1½   | 1½   | 1½   | 1½   | 2½    | 2½    | 3½    | 3½    | 4½    | 4½    | 5½    | 5½    |
| Upper, fig. 2735                | \$2 35 | 2 35 | 3 00 | 3 50 | 2 90 | 7 75  | 9 50  | 15 75 | 18 25 | 28 00 | 30 50 | 41 50 | 50 00 |
| Lower, fig. 2737                | 1 85   | 1 85 | 2 10 | 2 00 | 2 10 | 5 25  | 7 00  | 10 25 | 12 25 | 18 50 | 20 50 | 27 50 | 32 00 |
| Per set - - -                   | 4 20   | 4 20 | 5 10 | 5 50 | 5 00 | 13 00 | 16 50 | 26 00 | 30 50 | 46 50 | 51 00 | 69 00 | 82 00 |

### LIST OF PARTS FOR UPPER AND LOWER WORKING BARREL VALVES

| Size of tubing - - - inches                  | 1½           | 1½   | 2    | 2    | 2½   | 3    | 3½   | 4    | 4½   | 5    | 5½   | 6    |
|----------------------------------------------|--------------|------|------|------|------|------|------|------|------|------|------|------|
| Inside diameter of bbl. - inches             | 1½           | 1½   | 1½   | 1½   | 2½   | 2½   | 3½   | 3½   | 4½   | 4½   | 5½   | 5½   |
| Upper crowns - -                             | brass \$0 75 | 75   | 85   | 85   | 1 25 | 2 25 | 3 00 | 4 00 | 5 75 | 6 00 | 8 00 | 9 75 |
|                                              | steel        |      |      |      | 1 00 | 1 50 | 2 50 | 5 50 | 7 50 |      |      |      |
| Lower crowns - -                             | brass        | 85   | 85   | 85   | 1 25 | 2 25 | 3 00 | 4 00 | 5 75 | 6 00 | 8 00 | 9 75 |
|                                              | steel        |      |      |      | 1 00 | 1 50 | 2 50 | 5 50 | 7 50 |      |      |      |
| Barrels for upper valves                     | brass        | 1 00 | 1 00 | 1 10 | 1 10 | 1 65 | 2 75 | 4 50 | 5 00 | 7 00 | 8 00 | 9 00 |
|                                              | steel        |      |      |      |      |      |      |      |      |      |      |      |
| Barrels for lower valves                     | brass        | 65   | 65   | 75   | 75   | 1 35 | 2 00 | 3 00 | 3 50 | 5 50 | 6 00 | 8 00 |
|                                              | steel        |      |      |      |      |      |      |      |      |      |      |      |
| Perforated crowns for upper and lower valves | brass        |      |      |      | 1 25 | 2 50 | 3 75 |      |      |      |      |      |
|                                              | steel        |      |      |      | 3 00 | 4 50 | 6 00 |      |      |      |      |      |
| Lower parts or loops for upper valves - -    | brass        | 35   | 35   | 40   | 40   | 65   | 90   | 1 50 | 1 75 | 3 00 | 3 25 | 4 50 |
|                                              | steel        |      |      |      | 90   | 1 50 | 2 00 |      |      |      |      | 5 00 |
| Perforated lower parts for upper valves - -  | brass        |      |      |      | 75   | 1 50 | 2 25 |      |      |      |      |      |
|                                              | steel        |      |      |      | 1 75 | 3 00 | 4 00 |      |      |      |      |      |
| Cup rings - - - -                            | brass        | 25   | 25   | 25   | 25   | 40   | 55   | 75   | 85   | 1 35 | 1 50 | 2 00 |
|                                              | steel        |      |      |      | 60   | 1 00 | 1 35 | 1 75 | 2 00 |      |      | 2 50 |

### STEEL VALVES

| Size - - - inches    | 1½     | 2½    | 2½    |
|----------------------|--------|-------|-------|
| Upper, fig. 2747 - - | \$6 50 | 13 00 | 17 00 |
| Lower, fig. 2745 - - | 4 50   | 11 00 | 14 50 |
| Per set - - - -      | 11 00  | 24 00 | 31 50 |

### VALVES WITH STEEL CROWNS, BALLS AND SEATS

| Size - inches | 1½     | 2½    | 2½    | 3½    | 3½    |
|---------------|--------|-------|-------|-------|-------|
| Upper - -     | \$3 50 | 8 75  | 10 50 | 17 00 | 19 50 |
| Lower - -     | 2 25   | 6 00  | 7 75  | 10 50 | 13 50 |
| Per set - -   | 5 75   | 14 75 | 18 25 | 27 50 | 33 00 |

## WORKING BARREL VALVES

Fig. 2739



Fig. 2743



Fig. 2741



## DOUBLE BALL VALVES

Fig. 2750



Fig. 2752



## 1½-INCH TWO-CUP LOWER VALVE WITH STEEL BALL AND SEAT

|                                                 |        |
|-------------------------------------------------|--------|
| With leather rings and brass crown - - - -      | \$3 50 |
| With leather rings and steel crown - - - -      | 4 25   |
| Without leather rings, with brass crown - - - - | 3 25   |
| Without leather rings, with steel crown - - - - | 4 00   |

## 1½-INCH ONE-CUP LOWER VALVE WITH STEEL BALL AND SEAT

|                                                                     |        |
|---------------------------------------------------------------------|--------|
| With leather rings and brass crown - - - -                          | \$3 00 |
| With leather rings and steel crown - - - -                          | 3 75   |
| With bottom tapped for ¾-inch iron pipe, add to above lists - - - - | 75     |
| With brass ball instead of steel, add to above lists - - - -        | 15     |

| Inside diam. of barrel, in. | Price, upper valve | Price, lower valve |
|-----------------------------|--------------------|--------------------|
| 1½                          | \$7 00             | 4 00               |
| 2½                          | 11 00              | 7 00               |
| 2¾                          | 13 00              | 11 50              |
| 3½                          | 15 00              | 15 00              |

## SPECIAL VALVES FOR SHORT STROKE WORKING BARRELS FOR WATER WELLS

Not illustrated

| Inside diam. bbl., in. | 1½    | 1⅞     | 2½    | 2¾    | 3½    | 3¾    | 4½    | 4¾    | 5½    | 5¾    |
|------------------------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Upper - - - -          | ----- | \$2 50 | 6 50  | 8 50  | 13 50 | 17 00 | 25 25 | 27 50 | 34 00 | 40 00 |
| Lower - - - -          | ----- | 1 75   | 4 50  | 5 50  | 9 00  | 11 50 | 16 75 | 18 50 | 23 00 | 27 00 |
| Per set - - - -        | ----- | 4 25   | 11 00 | 14 00 | 22 50 | 28 50 | 42 00 | 46 00 | 57 00 | 67 00 |

## REVERSIBLE VALVE SEAT—Fig. 2794



## VALVE BALL—Fig. 2810



| Size valve for - - - - - inches   | 1½     | 1¾ | 1½ | 1⅞ | 2½ | 2¾   |
|-----------------------------------|--------|----|----|----|----|------|
| Diameter of ball - - - - - inches | ⅝      | ¾  | 1  | 1½ | 1½ | 1¾   |
| Brass balls - - - - -             | \$0 30 | 35 | 40 | 40 | 90 | 1 25 |
| Steel balls - - - - -             | 20     | 25 | 30 | 30 | 60 | 90   |
| Reversible brass seats - - - - -  | 25     | 25 | 30 | 40 | 60 | 75   |
| Reversible steel seats - - - - -  | 20     | 20 | 20 | 30 | 40 | 45   |

| Size valve for - - - - - inches   | 3½     | 3¾   | 4½    | 4¾    | 5½    | 5¾    |
|-----------------------------------|--------|------|-------|-------|-------|-------|
| Diameter of ball - - - - - inches | 2⅝     | 2¾   | 3     | 3½    | 3¾    | 4⅝    |
| Brass balls - - - - -             | \$1 50 | 2 25 | 3 00  | 3 25  | 5 00  | 6 50  |
| Steel balls - - - - -             | 2 50   | 4 50 | 6 00  | 10 00 | ----- | ----- |
| Reversible brass seats - - - - -  | 2 00   | 2 50 | 3 00  | ----- | ----- | ----- |
| Reversible steel seats - - - - -  | 50     | 1 50 | ----- | ----- | ----- | ----- |

## FLEMING SAND VALVE

Fig. 2758



Placed below the working barrel to separate sand from fluid. The sand pocket is formed by screwing a piece of tubing, with a cap on the lower end, into the bottom of the valve, and takes the place of the perforated pipe; any sand entering with the oil drops past the valve into this pocket.

Price, 1½ inch - - - - - \$6 00

## UPPER OR WORKING VALVES

FOR USE IN WELLS THAT CONTAIN SAND

LANDAS  
Fig. 2756

KIFER  
Fig. 2781



To expand the packing rings after they become worn, the valve is lowered until the lugs on the bottom engage in the top of the lower valve; the rods are then revolved (right-handed) until rings are sufficiently expanded.

ROPE  
Fig. 2754



The rope packing is expanded by screwing down the top.

LEWIS  
Fig. 2783



The rubber rings are expanded by screwing down the top.



The rope packing is kept constantly expanded by a sliding follower with a coil spring above.

| Inside diam. of barrel, in. | 1½      | 2½    | 2¾    | 3¾    |
|-----------------------------|---------|-------|-------|-------|
| Kifer, fig. 2781 - - - -    | \$12 00 | ----  | ----  | ----  |
| Rope, fig. 2754 - - - -     | 5 00    | 8 00  | ----  | ----  |
| Extra rope for rope valve - | 15      | 20    | ----  | ----  |
| Lewis, fig. 2783 - - - -    | 7 50    | 12 35 | ----  | ----  |
| Landas, fig. 2756 - - - -   | 8 00    | 15 00 | 25 00 | 40 00 |

## PARTS OF LANDAS VALVE

| Size valve for, inches | 1½     | 2½   | 2¾   | 3¾   |
|------------------------|--------|------|------|------|
| Balls - - - -          | \$0 40 | 1 25 | 1 75 | 2 00 |
| Seats - - - -          | 40     | 80   | 1 00 | 1 75 |
| Locknuts - - - -       | 40     | 60   | 1 25 | 2 00 |
| Followers - - - -      | 2 00   | 3 00 | 4 00 | 6 50 |
| Springs - - - -        | 80     | 1 00 | 1 75 | 2 00 |
| Set screws - - - -     | 10     | 10   | 20   | 25   |
| Tubes - - - -          | 1 50   | 3 25 | 6 00 | 9 00 |
| Cages - - - -          | 1 00   | 2 50 | 5 00 | 8 00 |
| Bottoms - - - -        | 50     | 1 00 | 2 50 | 4 00 |
| Seat frames - - - -    | 1 00   | 1 50 | 2 75 | 4 50 |

Cord for Landas valve, cotton - per foot, \$0 02½  
Cord for Landas valve, hemp - per foot, 03

## PARTS OF LEWIS VALVE

| Size valve for - - inches              | 1½     | 2½   |
|----------------------------------------|--------|------|
| Bottom, with seat - -                  | \$1 50 | 3 00 |
| Bottom, with seat and strainer - - - - | 2 00   | 4 00 |
| Balls, brass - - - -                   | 50     | ---- |
| Balls, steel - - - -                   | 70     | ---- |
| Rings, leather - per set               | 75     | ---- |
| Rings, linen - per set                 | 75     | 2 50 |

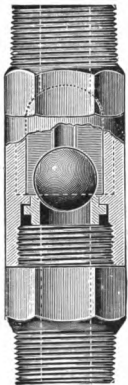
**"HERRON SPECIAL" VALVE CROWN****UPPER****Fig. 2759****TOP VIEW****Fig. 2761****LOWER****Fig. 2760**

Designed for pumping heavy oils. The valve ball cannot "stick" against the top of the crown, as the side openings are cut at an angle, permitting the downward pressure of the fluid to act on the ball, forcing it to the seat.

| Size valve for - - - - - inches | 1½     | 2½   |
|---------------------------------|--------|------|
| Upper valve - - - - -           | \$2 25 | 5 25 |
| Lower valve - - - - -           | 2 25   | 5 25 |

**CROWN****SOLID  
VALVE SEAT****Fig. 2811 Fig. 2812 Fig. 2813****EVERLASTING VALVE CROWN,  
VALVE, AND SEAT**

| Size valve for - - - - - inches | 1½     | 2½   | 2¾   |
|---------------------------------|--------|------|------|
| Complete - - - - -              | \$2 00 | 3 00 | 4 00 |
| Crown only - - - - -            | 1 50   | 2 25 | 3 00 |
| Valve only - - - - -            | 30     | 50   | 70   |
| Seat only - - - - -             | 25     | 40   | 50   |

**Fig. 2784****THE BETTS  
VALVE**

For attaching to lower coupling of working barrel, serving as a double check. Particularly adapted for use in oil wells producing large quantities of water.

| Size - in. | 2      | 2½    | 3     |
|------------|--------|-------|-------|
| Price - -  | \$7 00 | 10 00 | 22 50 |

**HUGHES' UPPER  
VALVE****Fig. 2768**

The rubber packing is distended by the cone.

| Inside diameter<br>of barrel, inches | 1½     | 2½    | 2¾    |
|--------------------------------------|--------|-------|-------|
| Price, complete -                    | \$8 50 | 14 00 | 18 00 |

**PARTS OF HUGHES' VALVE**

| Size - - - - - inches     | 1½     |
|---------------------------|--------|
| Cone only - - - - -       | \$0 20 |
| Steel rings - - - - -     | 60     |
| Body, with steel seat - - | 3 50   |
| Rubbers - - - - -         | 50     |

**BEERS BROS. EXTENSION VALVE**

| Size tubing for - - - - - inches | 2      | 2½    | 3     | 4     |
|----------------------------------|--------|-------|-------|-------|
| Complete - - - - - each          | \$5 00 | 12 00 | 15 00 | 30 00 |
| Tops only - - - - - "            | 2 50   | 7 00  | 8 00  | 20 00 |
| Bottoms only - - - - - "         | 2 00   | 4 00  | 6 00  | 10 00 |
| Drops only - - - - - "           | 1 00   | 1 10  | 1 25  | 3 00  |
| Seats only - - - - - "           | 1 00   | 1 10  | 1 25  | 2 50  |



## KINNEY GAS—UPPER VALVE



Fig. 2790

This valve is used for pumping fluid where the pressure of gas prevents the ball in a regular valve from working properly.

| Inside diameter of barrel - - - - inches | 1 $\frac{1}{2}$ | 2 $\frac{1}{4}$ | 2 $\frac{3}{4}$ |
|------------------------------------------|-----------------|-----------------|-----------------|
| Price - - - - -                          | \$9 00          | 14 50           | 21 00           |

## VALVE CUPS

**LEATHER**  
Fig. 2798

**BOW SPRING**  
Fig. 2804

**METALLIC**  
Fig. 2806


| Size - - - - inches         | $\frac{7}{8}$ to 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 2 $\frac{1}{4}$  | 2 $\frac{3}{4}$ | 3 $\frac{1}{4}$ | 3 $\frac{3}{4}$ | 4 $\frac{1}{4}$ | 4 $\frac{3}{4}$ | 5 $\frac{1}{4}$ | 5 $\frac{3}{4}$ | 6 $\frac{1}{4}$ | 7 $\frac{1}{4}$ |
|-----------------------------|----------------------------------|-----------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Leather, fig. 2798 - - - -  | \$0 05                           | 05              | 15               | 25              | 38              | 45              | 1 00            | 1 20            | 1 40            | 1 50            | 2 25            | 2 50            |
| Rubber - - - - -            | ---                              | 20              | 40               | ---             | ---             | ---             | ---             | ---             | ---             | ---             | ---             | ---             |
| Never cut - - - - -         | 11 $\frac{1}{2}$                 | 15              | 18 $\frac{1}{2}$ | 25              | ---             | ---             | ---             | ---             | ---             | ---             | ---             | ---             |
| Bow spring, fig. 2804 - - - | 09                               | 12              | 20               | 25              | 50              | 60              | ---             | ---             | ---             | ---             | ---             | ---             |
| Metallic fig. 2806 - - - -  | 10                               | 12              | 20               | 25              | ---             | ---             | ---             | ---             | ---             | ---             | ---             | ---             |
| Everlasting - - - - -       | ---                              | 10              | 12               | 14              | ---             | ---             | ---             | ---             | ---             | ---             | ---             | ---             |
| Acme - - - - -              | ---                              | 14              | 19               | 26              | ---             | ---             | ---             | ---             | ---             | ---             | ---             | ---             |
| Graphite - - - - -          | ---                              | 20              | 40               | 50              | ---             | ---             | ---             | ---             | ---             | ---             | ---             | ---             |

## LEATHER VALVE RINGS

| Size valves for, inches | $\frac{7}{8}$ | 1 $\frac{1}{8}$ | 1 $\frac{3}{8}$ | 1 $\frac{1}{2}$ | 2 $\frac{1}{4}$ | 2 $\frac{3}{4}$ | 3 $\frac{1}{4}$ | 3 $\frac{3}{4}$ | 4 $\frac{1}{4}$ | 4 $\frac{3}{4}$ | 5 $\frac{1}{4}$ | 5 $\frac{3}{4}$ |
|-------------------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Price - - - - per 100   | \$0 75        | 85              | 90              | 1 00            | 2 40            | 3 00            | 5 25            | 7 00            | 10 00           | 13 00           | 14 50           | 16 00           |

## CASING CUPS

| Size - - inches | 4               | 4 $\frac{1}{4}$ | 4 $\frac{1}{2}$ | 4 $\frac{3}{4}$ | 5               | 5 $\frac{1}{4}$ | 5 $\frac{1}{2}$ | 5 $\frac{3}{8}$ | 6               | 6 $\frac{1}{4}$ |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Price - - - - - | \$0 90          | 1 00            | 1 10            | 1 25            | 1 25            | 1 50            | 1 50            | 1 50            | 1 65            | 1 75            |
| Size - - inches | 6 $\frac{1}{2}$ | 6 $\frac{3}{8}$ | 6 $\frac{3}{4}$ | 7               | 7 $\frac{1}{4}$ | 7 $\frac{1}{2}$ | 7 $\frac{3}{4}$ | 8               | 8 $\frac{1}{4}$ | 8 $\frac{3}{8}$ |
| Price - - - - - | \$1 75          | 1 90            | 1 90            | 2 00            | 2 00            | 2 15            | 2 25            | 2 50            | 2 50            | 3 25            |

## PUMP CUPS

| Size - - inches | 1 $\frac{1}{2}$ | 2  | 2 $\frac{1}{2}$ | 3  | 3 $\frac{1}{2}$ | 4    | 4 $\frac{1}{2}$ | 5    | 6    | 7    | 8    |
|-----------------|-----------------|----|-----------------|----|-----------------|------|-----------------|------|------|------|------|
| Price - - - - - | \$0 05          | 15 | 25              | 38 | 45              | 1 00 | 1 20            | 1 40 | 1 75 | 2 50 | 3 50 |

CROCKER  
CHECK  
VALVE  
WITH  
ROD

STEEL  
SEAT  
Fig. 2788

Fig. 2785

CROCKER CHECK VALVE AND PARTS



| Size - - - - - inches                      | 1½     | 2¼    | 2½    | 3¼    | 3½    |
|--------------------------------------------|--------|-------|-------|-------|-------|
| Valve, complete with rod and connections - | \$7 25 | 12 00 | 18 50 | 22 00 | 28 75 |
| Valve only - - - - -                       | 6 00   | 10 00 | 15 50 | 17 00 | 23 00 |
| Steel check - - - - -                      | 60     | 1 50  | 2 00  | 2 50  | 3 25  |
| Brass check - - - - -                      | 75     |       |       |       |       |
| Crown - - - - -                            | 1 00   | 2 00  | 2 75  | 3 25  | 3 75  |
| Upper connections, iron - - - - -          | 50     | 65    | 75    | 1 25  | 1 50  |
| Lower connections, iron - - - - -          | 50     | 65    | 75    | 1 25  | 1 50  |
| Upper connections, brass - - - - -         | 75     |       |       |       |       |
| Lower connections, brass - - - - -         | 75     |       |       |       |       |
| Iron rods - - - - -                        | 50     | 1 00  | 2 00  | 3 00  | 3 50  |
| Steel seats, fig. 2788 - - - - -           | 50     |       |       |       |       |

TAP TO DRAW LOWER VALVE

| Size valve for - - - inches | 1½     | 2¼   | 2½   |
|-----------------------------|--------|------|------|
| Price - - - - -             | \$2 30 | 2 50 | 3 00 |

Fig. 2777



Fig. 2779



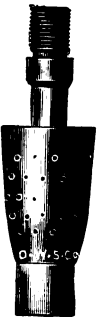
VALVE REAMER

|                                                    |        |
|----------------------------------------------------|--------|
| For valves 1½-inches and smaller - - - - -         | \$2 00 |
| Special fine cut for 1½-inch and smaller - - - - - | 2 50   |
| For 2-inch tubing - - - - -                        | 3 50   |

RIVET CATCHER

| Size - - - - - Inches     | 1½     | 2¼   | 2½   | 3¼   | 3½   | 4½   |
|---------------------------|--------|------|------|------|------|------|
| With brass bowl - - - - - | \$2 50 | 2 75 | 3 50 | 4 00 | 5 00 | 6 00 |
| All steel - - - - -       | 3 25   | 3 50 | 4 00 | 5 00 | 6 50 |      |
| Steel stem only - - - - - | 85     | 1 00 | 1 25 | 1 50 | 1 85 | 2 25 |
| Steel bowl only - - - - - | 2 50   | 2 60 | 3 00 | 3 75 | 5 00 |      |

Fig. 2808





**WOODEN SUCKER OR PUMP ROD**

Fig. 2680



|                                      |        |       |       |        |      |
|--------------------------------------|--------|-------|-------|--------|------|
| Size - - - - - inches                | 1½     | 1½    | 1½    | 2¼     | 3½   |
| Number of rivets - - - - -           | 5      | 6     | 7     | 6      | 7    |
| Size of box and pin - - - - - inches | ¾      | ¾     | 1     | 1½     | 1½   |
| Size tubing for - - - - - inches     | 2, 2½  | 2, 2½ | 2½, 3 | 3 to 4 | 5, 6 |
| Weight per 100 feet - - - - - lbs.   | 105    | 110   | 150   | 250    | ---  |
| Fig. 2680 - - - - - per foot         | ---    | ---   | ---   | ---    | ---  |
| WOOD PONY RODS - - - - -             | \$1 50 | 1 50  | 2 00  | 2 75   | ---  |

**SOLID IRON SUCKER ROD**

Fig. 2682



Round iron or steel for small tubing.

|                                      |       |     |       |       |       |
|--------------------------------------|-------|-----|-------|-------|-------|
| Size - - - - - inches                | 1½    | 1½  | 1½    | 1½    | 2     |
| Size of box and pin - - - - - inches | ¾     | 1½  | 1½    | 1½    | 1½    |
| Size tubing for - - - - - inches     | 1½ 1½ | 2   | 2     | 2, 2½ | 2½, 3 |
| Weight per 1,000 feet - - - - - lbs. | 910   | 910 | 1,125 | 1,350 | 2,250 |
| Per foot - - - - -                   | ---   | --- | ---   | ---   | ---   |

Prices on application

**STUB JOINT FOR WELDING TO IRON ROD**

Fig. 2841



| Number - - - - -               | 39     | 40  | 42  | 45  | 47  | 48  | 49  | 50   | 51   | 52   | 53   | SPECIAL   |     |     |     |
|--------------------------------|--------|-----|-----|-----|-----|-----|-----|------|------|------|------|-----------|-----|-----|-----|
|                                |        |     |     |     |     |     |     |      |      |      |      | P. H. Co. | --  | --  | --  |
|                                |        |     |     |     |     |     |     |      |      |      |      | 40        | 42  | 41  | 43  |
| Size of box and pin, inches    | 1½     | 1½  | 1½  | 1   | 1½  | 1½  | 1½  | 1½   | 1½   | 1½   | 2    | 1½        | 1½  | 1½  | 1½  |
| Number threads per inch -      | 14     | 12  | 10  | 10  | 8   | 8   | 8   | 8    | 8    | 8    | 8    | 11        | 10  | 11  | 12  |
| Size of rod, hollow - inches   | ---    | --- | ¾   | 1   | --- | 1½  | 1½  | 2    | ---  | 2½   | ---  | ---       | --- | --- | --- |
| Size of rod, solid - inches    | 1½     | 1½  | --- | --- | 1   | --- | --- | ---  | ---  | ---  | ---  | ---       | --- | --- | --- |
| Size of sq. for wrench, inches | 1½     | 1½  | 1½  | 1   | 1½  | 1½  | 1½  | 1½   | 1½   | 2    | 2½   | ---       | --- | --- | --- |
| Length of joint - - - inches   | 8      | 8   | 9   | 9½  | 11  | 12  | 13  | 14   | 17½  | 17½  | 24   | ---       | --- | --- | --- |
| Nominal weight - - - lbs.      | 1      | 1½  | 2½  | 3   | 5½  | 7   | 9½  | 11   | 20   | 25   | 40   | ---       | --- | --- | --- |
| Price, fig. 2841 - - - -       | \$0 20 | 20  | 30  | 35  | 55  | 60  | 90  | 1 25 | 4 50 | 4 75 | 7 50 | 20        | 35  | 25  | 25  |

**AJAX AND ACME IRON SUCKER ROD**

Fig. 2683



|                                      |     |        |     |       |       |       |
|--------------------------------------|-----|--------|-----|-------|-------|-------|
| Size rods - - - - - inches           | 1½  | 1½     | 1½  | 1½    | 1½    | 2     |
| Size of box and pin - - - - - inches | ¾   | ¾      | 1   | 1½    | 1½    | 1½    |
| Size tubing for - - - - - inches     | 1½  | 1½, 1½ | 2   | 2     | 2½    | 2½, 3 |
| Weight per 1000 feet - - - - - lbs.  | 720 | 910    | 910 | 1,125 | 1,350 | 2,250 |

Prices on application

STUB JOINT

FOR WELDING TO AJAX OR ACME IRON SUCKER RODS

Fig. 2844



|                            |        |                |                |                |                |                |                |
|----------------------------|--------|----------------|----------------|----------------|----------------|----------------|----------------|
| Size rods - - - - -        | inches | $\frac{9}{16}$ | $\frac{9}{16}$ | $\frac{5}{8}$  | $1\frac{1}{8}$ | $\frac{3}{4}$  | $\frac{7}{8}$  |
| Size box and pin - - - - - | inches | $\frac{3}{4}$  | $1\frac{1}{8}$ | $1\frac{1}{8}$ | $1\frac{5}{8}$ | $1\frac{5}{8}$ | $1\frac{1}{4}$ |
| Price - - - - -            |        | \$0 60         | 60             | 75             | 1 00           | 1 50           | 2 00           |

SUCKER ROD TOOLS

SUCKER ROD ELEVATORS—Fig. 2863



| For size square, inches | For No. joint | Weight, lbs. | Per set | Weight, lbs. | Per set | Weight, lbs. | Per set | Weight, lbs. | Per set | Weight, lbs. | Per set |
|-------------------------|---------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|
| 00, 0, 1                | 2, 3, 4       | 20           | \$6 25  | 30           | \$8 00  | 45           | \$11 00 | 60           | \$16 00 | 75           | \$18 00 |
| 1                       | 5, 6          | 20           | 6 75    | 30           | 8 25    | 45           | 11 75   |              |         |              |         |
| 1 $\frac{1}{4}$         | 7             | 20           | 7 00    | 30           | 8 50    | 45           | 12 00   |              |         |              |         |
| 1 $\frac{1}{2}$         | 8, 9          |              |         | 30           | 8 75    | 45           | 12 50   |              |         |              |         |
| 1 $\frac{3}{4}$         | 10            |              |         |              |         | 45           | 13 00   |              |         |              |         |
| 2                       | 11            |              |         |              |         | 45           | 13 50   |              |         |              |         |
| 2 $\frac{1}{2}$         | 12            |              |         |              |         |              |         |              |         |              |         |
|                         | 13            |              |         |              |         |              |         |              |         |              |         |

SUCKER ROD WRENCHES

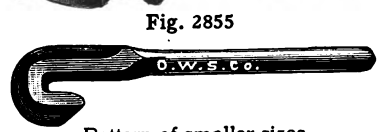


Fig. 2855

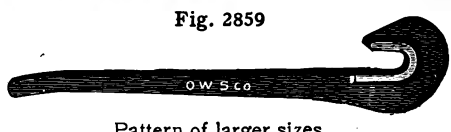


Fig. 2859

Pattern of smaller sizes

Pattern of larger sizes

| No.  |                                            | Weight, lbs. | Size of square, inches | Price  |
|------|--------------------------------------------|--------------|------------------------|--------|
| 1    | For Nos. 00, 0 and 1 S. R. joint - - - - - | 3            | $\frac{5}{8}$          | \$0 50 |
| 3    | For Nos. 2, 3, 4 S. R. joint - - - - -     | 4            | $\frac{7}{8}$          | 55     |
| 5    | For Nos. 5 and 6 S. R. joint - - - - -     | 4            | 1                      | 1 00   |
| 7    | For No. 7 S. R. joint - - - - -            | 12           | 1 $\frac{1}{4}$        | 2 00   |
| 9    | For Nos. 8 and 9 S. R. joint - - - - -     | 14           | 1 $\frac{3}{8}$        | 2 00   |
| 10   | For No. 10 S. R. joint - - - - -           | 27           | 1 $\frac{1}{2}$        | 2 50   |
| 11   | For No. 11 S. R. joint - - - - -           | 30           | 1 $\frac{3}{4}$        | 4 50   |
| 12   | For No. 12 S. R. joint - - - - -           | 40           | 2                      | 6 00   |
| 13   | For No. 13 S. R. joint - - - - -           | 60           | 2 $\frac{1}{4}$        | 8 00   |
| ---- | Jumbo, not illustrated - - - - -           | ----         | ----                   | 2 25   |

SUCKER ROD HOOK

Fig. 2684



|                            |                 |                                   |                                                     |                                   |
|----------------------------|-----------------|-----------------------------------|-----------------------------------------------------|-----------------------------------|
| Size rods for - - - inches | 1 $\frac{5}{8}$ | 1 $\frac{3}{4}$ , 1 $\frac{7}{8}$ | 1 $\frac{5}{8}$ , 1 $\frac{3}{4}$ , 2 $\frac{1}{4}$ | 2 $\frac{1}{4}$ , 3 $\frac{1}{4}$ |
| Weight - - - - - lbs.      | 5               | 10                                | 15                                                  | 20                                |
| Price - - - - -            | \$1 25          | 1 50                              | 2 50                                                | 3 50                              |

# SUCKER ROD TOOLS

Fig. 2687



## BALL BEARING SWIVEL HOOK

PARTICULARLY ADAPTED FOR USE WITH WIRE LINE

|                                      |                |               |               |               |       |                |
|--------------------------------------|----------------|---------------|---------------|---------------|-------|----------------|
| Capacity - - - - - lbs.              | 300            | 500           | 1,000         | 2,000         | 4,000 | 5,000          |
| Size of shaft through B. B. cup, in. | $\frac{1}{4}$  | $\frac{3}{8}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | 1     | $1\frac{1}{8}$ |
| Length of swivel complete - - in.    | $4\frac{1}{2}$ | 5             | 8             | 9             | 12    | 13             |
| Price - - - - -                      | \$0 50         | 1 00          | 5 00          | 5 50          | 8 00  | 9 00           |

|                                      |                |                |                |                |        |                |
|--------------------------------------|----------------|----------------|----------------|----------------|--------|----------------|
| Capacity - - - - - lbs.              | 6,000          | 8 000          | 10,000         | 14,000         | 18,000 | 25,000         |
| Size of shaft through B. B. cup, in. | $1\frac{1}{4}$ | $1\frac{3}{4}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ | 2      | $2\frac{1}{2}$ |
| Length of swivel complete - - in.    | 14             | 16             | 18             | 20             | 24     | 36             |
| Price - - - - -                      | \$10 00        | 11 00          | 20 00          | 30 00          | 40 00  | 75 00          |

## SUCKER ROD RIVETERS

Fig. 2871

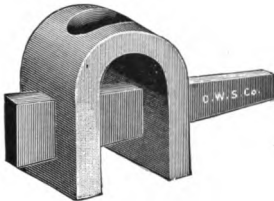
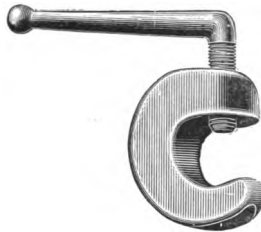


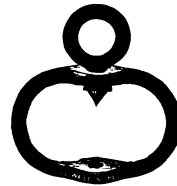
Fig. 2873



|                               |                |                |
|-------------------------------|----------------|----------------|
| Size rod for - - - - - inches | $1\frac{1}{8}$ | $2\frac{1}{4}$ |
| Weight - - - - - lbs.         | 14             | 14             |
| Fig. 2871 - - - - -           | \$3 00         | 4 00           |
| Fig. 2873 - - - - -           | 2 50           | 3 50           |

## SUCKER ROD SWIVEL

Fig. 2876



| Size pin, in.                | Weight, lbs. | Price  |
|------------------------------|--------------|--------|
| $\frac{9}{16}$               | 8            | \$1 25 |
| $\frac{7}{8}$                | 10           | 2 35   |
| 1                            | 12           | 2 50   |
| $1\frac{1}{8}, 1\frac{1}{4}$ | 14           | 5 50   |
| $1\frac{1}{2}$               | 16           | 6 50   |

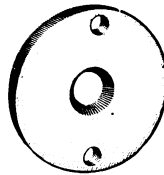
## SUCKER ROD CLEANERS

Fig. 2878



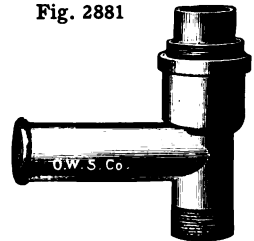
Complete

Fig. 2879



Rubber

Fig. 2881



|                                    |        |
|------------------------------------|--------|
| Fig. 2878 - - - - -                | \$4 00 |
| Weight - - - - - lbs.,             | 12     |
| Extra rubbers, fig. 2879 - - - - - | 1 25   |

|                         |        |
|-------------------------|--------|
| Fig. 2881 - - - - -     | \$4 00 |
| Weight - - - - - lbs.,  | 7      |
| Extra rubbers - - - - - | 1 25   |

For sucker rod lines, see pages 131 and 132

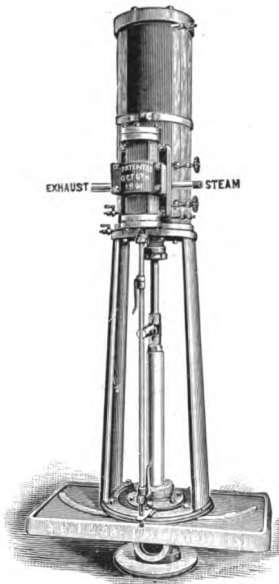


## SUCKER ROD BIT—Fig. 5584

|                 |                   |
|-----------------|-------------------|
| No. 4 - - - - - | per dozen, \$1 46 |
| No. 5 - - - - - | per dozen, 1 58   |

|                                        |                   |
|----------------------------------------|-------------------|
| No. 6 - - - - -                        | per dozen, \$1 70 |
| $\frac{3}{8}$ -inch diameter - - - - - | per dozen, 2 50   |

Fig. 3229



**DIRECT-ACTING ARTESIAN OR  
DEEP WELL PUMPING  
ENGINE**

**THE LATEST PATTERN OF COOK'S VERTICAL DIRECT-ACTING  
PUMPING ENGINE**

It has no "dead center," always starting when steam is turned on. These engines will work without shock or jar, as the amount of steam for downward or upward strokes can be regulated by the engineer. There being separate adjustable valves for upward and downward strokes, a perfectly uniform motion is produced without regard to weight of the reciprocating parts. It is especially designed for non-flowing artesian or tube wells, where water does not rise to within drafting distance of the surface, and will successfully raise water from the deepest wells. The pump bucket discharging on the upper stroke and the top plunger, shown in cut, discharging on the down stroke, make the flow of water steady and continuous. The cut shows the manner in which pump is repaired; thus: Removing the lower key from crosshead and three of the bolts from the base, the engine revolves on the fourth bolt entirely to one side, allowing sufficient room to withdraw the rods and working parts of the pump.

|                                     |          |        |        |        |        |
|-------------------------------------|----------|--------|--------|--------|--------|
| Diameter of steam cylinder - inches | 4        | 5      | 6      | 8      | 10     |
| Length of stroke - - - - inches     | 24       | 24     | 24     | 24     | 24     |
| Weight - - - - - lbs.               | 535      | 800    | 900    | 1,325  | 1,525  |
| Price - - - - -                     | \$130 00 | 145 00 | 160 00 | 240 00 | 285 00 |

|                                     |          |        |        |        |        |
|-------------------------------------|----------|--------|--------|--------|--------|
| Diameter of steam cylinder - inches | 6        | 8      | 10     | 12     | 14     |
| Length of stroke - - - - inches     | 36       | 36     | 36     | 36     | 36     |
| Weight - - - - - lbs.               | 975      | 1,525  | 1,725  | 2,240  | 2,600  |
| Price - - - - -                     | \$200 00 | 275 00 | 310 00 | 420 00 | 520 00 |

**SURFACE EQUIPMENT FOR PUMPING WELLS**

This includes all material required for connecting a group of wells to pumping power. The illustrations following show the various forms of our regular pumping equipment, and which we are making in standard weights and sizes to suit the requirements of the different oil fields.

Orders for "special" pumping equipment should be accompanied by sketches showing design and size of material required.

## SURFACE EQUIPMENT FOR PUMPING WELLS

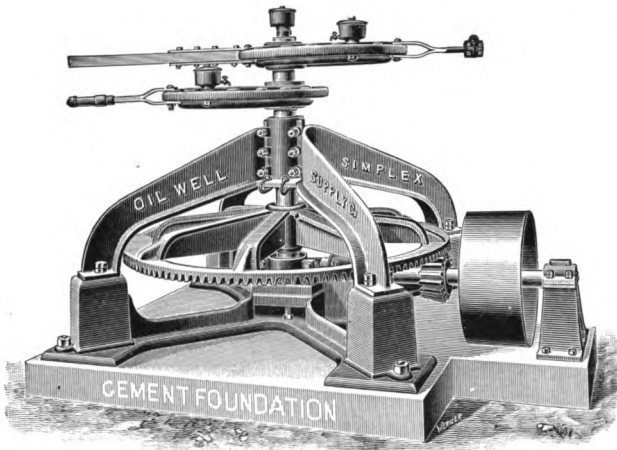
SIMPLEX PUMPING  
POWER

Fig. 3321

Length of bed plate, 6 ft. 3 in.  
 Width of bed plate, 6 ft. 3 in.  
 Height of frame - 5 ft. 10 in.  
 Diam. of large gear, 6 ft. 0 in.  
 Diameter of pinion - 11 in.  
 Diameter of main shaft, 5 in.

Shipping weight, 6,100 lbs.

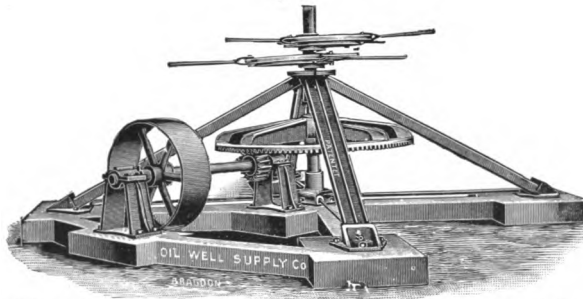
Complete with two eccentrics - - - - - \$315 00

The Simplex power has but two parts in the frame. It is of desirable height, and both eccentrics being above the frame, make it possible to connect from any angle. All bearings are large and powerful, and of the best material and workmanship.

Steel shafting, anti-friction washers, patent step box with adjustment, dead-line connections for hooking on wells, sight-feed cups, self-oiling eccentrics, out-end bearing, and necessary hand holes for removing bolts.

## PYRAMID PUMPING POWER

Fig. 3341



## No. 1 PYRAMID POWER

Horizontal shaft - - - 3½ in. x 7 ft. 3 in.  
 Vertical shaft - - - 4½ in. x 5 ft. 6 in.  
 Diameter of large gear - - - 7 ft. 0 in.  
 Diameter of pinion - - - 11½ in.

## No. 2 PYRAMID POWER

Horizontal shaft - - - 3½ in. x 4 ft. 6 in.  
 Vertical shaft - - - 4½ in. x 5 ft. 6 in.  
 Diameter of large gear - - - 6 ft. 0 in.  
 Diameter of pinion - - - 11 in.

Unsurpassed in strength, because of the large base, with braces of structural steel and strain rods running direct to box on shaft and pivot bearing, where greatest strains come. Can be set on either wood or concrete foundation for less than cost of setting other powers. No braces to interfere with connecting rods running in any desired direction. Holes in top plate of frame for dead-line attachments to hook off lines without going to wells to block up; adjuster screw in step box to adjust bevel gears; self-oiling eccentrics; easily taken apart and transported.

No. 1, complete with one eccentric, \$300 00; with two eccentrics, \$325 00

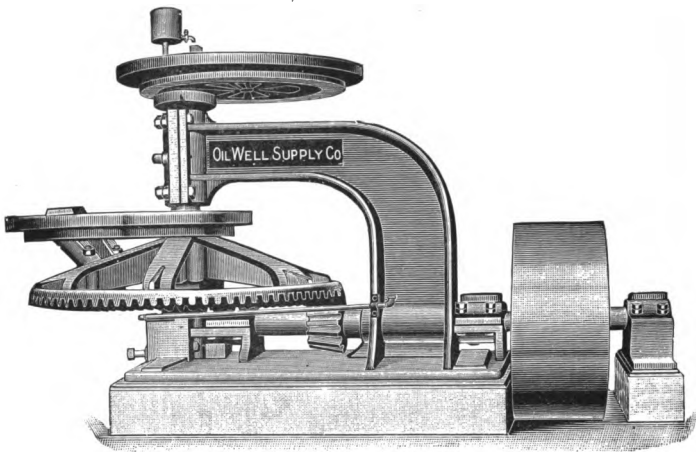
No. 2, complete with one eccentric, 280 00; with two eccentrics, 300 00

Shipping weight: No. 1 power, 6,150 lbs.; No. 2 power, 4,600 lbs.



No. 1 "C" PUMPING POWER

Fig. 3336



DESIGNED FOR 12 WELLS OF AVERAGE DEPTH

It is very strong and compact. Can be mounted on timber or cement foundation; vertical shaft 4 inches diameter, with two bearings; horizontal shaft 3½ inches with three bearings. Adjustable Step Box to provide for constant and perfect alignment. Two Eccentrics or one, as may be desired.

Weight complete, 4650 lbs.

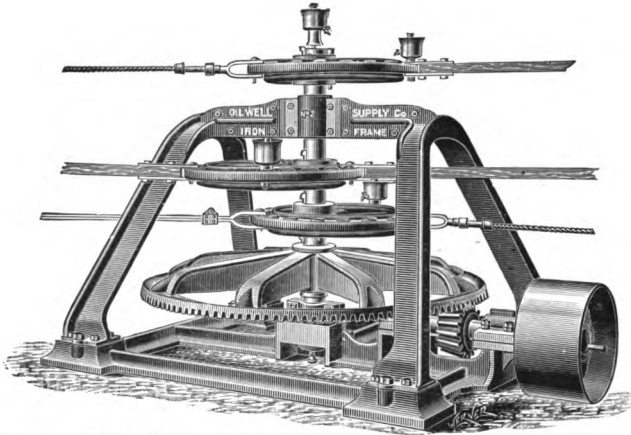
Base measurements, 3 ft. x 4 ft. 6 in.

|                           |           |          |
|---------------------------|-----------|----------|
| Power with one Eccentric  | - - - - - | \$240 00 |
| Power with two Eccentrics | - - - - - | 260 00   |

## SURFACE EQUIPMENT FOR PUMPING WELLS

### IRON FRAME PUMPING POWER

Figs. 3310 and 3315



Showing method of connecting with wood rods, iron rods, or wire cable.

#### DIMENSIONS No. 1 POWER

Fig. 3310

|                            |       |                   |
|----------------------------|-------|-------------------|
| Length of bed plate        | - -   | 9 feet 2 inches   |
| Width of bed plate         | - -   | 7 feet 4½ inches  |
| Height of frame            | - -   | 6 feet 10½ inches |
| Diameter of large gear     | -     | 7 feet 0 inches   |
| Diameter of pinion         | - -   | 11½ inches        |
| Diameter of main shaft     | -     | 5 inches          |
| Length of main shaft       | -     | 5 feet 6 inches   |
| Complete with 2 eccentrics | - -   | \$400 00          |
| Complete with 3 eccentrics | - -   | 435 00            |
| Complete with 4 eccentrics | - -   | 460 00            |
| Shipping weight            | - - - | 10,000 lbs.       |

#### DIMENSIONS No. 2 POWER

Fig. 3315

|                            |         |                  |
|----------------------------|---------|------------------|
| Length of bed plate        | - -     | 7 feet 4 inches  |
| Width of bed plate         | - -     | 5 feet 10 inches |
| Height of frame            | - -     | 4 feet 6 inches  |
| Diameter of large gear     | -       | 6 feet 0 inches  |
| Diameter of pinion         | - - -   | 11 inches        |
| Diameter of shaft          | - - -   | 4½ inches        |
| Complete with 1 eccentric  | - -     | \$275 00         |
| Complete with 2 eccentrics | - -     | 315 00           |
| Complete with 3 eccentrics | - -     | 340 00           |
| Shipping weight            | - - - - | 6,000 lbs.       |

#### No. 2 IRON FRAME PUMPING POWER

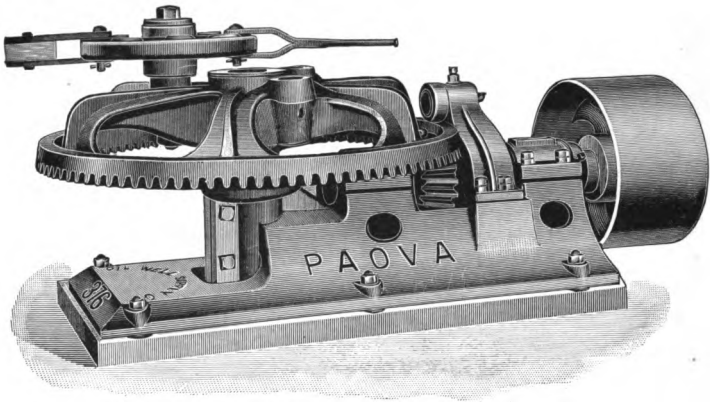
With eccentric below and crank and disc above frame. Made to order only.

|                                                                  |           |            |
|------------------------------------------------------------------|-----------|------------|
| Price of power complete, same as fig. 3315, crank and disc extra | - - - - - | \$45 00    |
| Shipping weight                                                  | - - - - - | 6,000 lbs. |

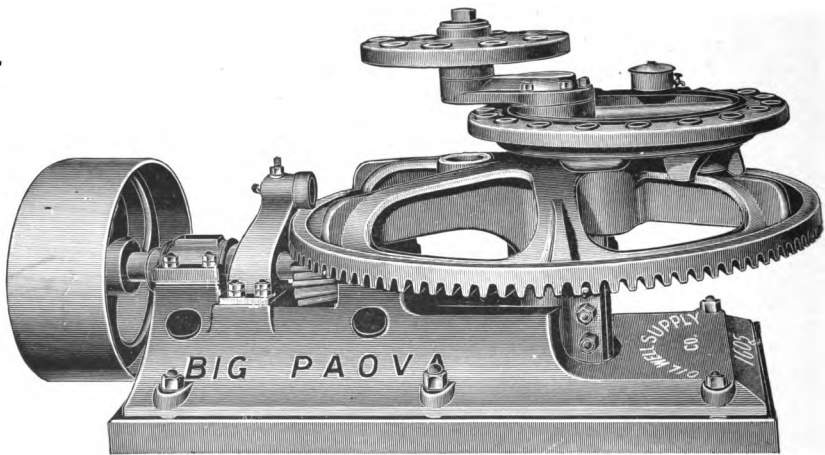
SURFACE EQUIPMENT FOR PUMPING WELLS

PAOVA PUMPING POWERS

Paova. Fig. 3343



Big Paova, Fig. 3344



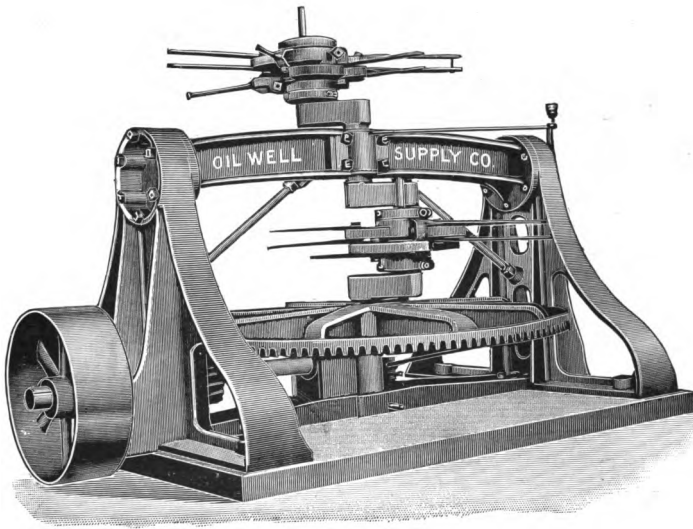
Dimensions, Weight and Price

|                                      | Paova    | Big Paova<br>1 Disc | Big Paova<br>Eccentric<br>and Disc |
|--------------------------------------|----------|---------------------|------------------------------------|
| Length of bed plate - - - - - inches | 60       | 70                  | 70                                 |
| Width of bed plate - - - - - "       | 24       | 30                  | 30                                 |
| Height of eccentrics - - - - - "     | 30       | 31                  | 31-40                              |
| Diameter of large gear - - - - - "   | 48       | 61                  | 61                                 |
| Diameter of pinion - - - - - "       | 8        | 9½                  | 9½                                 |
| Diameter of main shaft - - - - - "   | 3½       | 3½                  | 3½                                 |
| Weight - - - - - lbs.                | 2250     | 3050                | 3500                               |
| Price - - - - -                      | \$170 00 | 230 00              | 270 00                             |

## SURFACE EQUIPMENT FOR PUMPING WELLS

## YATES IRON FRAME CRANK SHAFT PUMPING POWER

Fig. 3338



| Dimensions                                | No. 1      | No. 2        |
|-------------------------------------------|------------|--------------|
| Length of Frame - - - - -                 | 9 ft 7 in. | 9 ft. 1½ in. |
| Width of Frame - - - - -                  | 6 " 0 "    | 5 " 0 "      |
| Height of Frame from foundation - - - - - | 4 " 8 "    | 4 " 3½ "     |
| Height of Shaft - - - - -                 | 6 " 5 "    | 5 " 11 "     |
| Height of upper flange for rod - - - - -  | 6 " 1 "    | 5 " 7 "      |
| Height of lower flange for rod - - - - -  | 3 " 2 "    | 2 " 10 "     |
| Diameter of master gear - - - - -         | 7 " 0 "    | 5 " 10 "     |
| Diameter of pinion - - - - -              | 11 "       | 8½ "         |
| Diameter of crank shaft - - - - -         | 5 "        | 4½ "         |
| Diameter of pinion shaft - - - - -        | 3½ "       | 3½ "         |
| Weight - - - - - lbs.                     | 8600       | 6500         |
| Price complete - - - - -                  | \$520 00   | 410 00       |

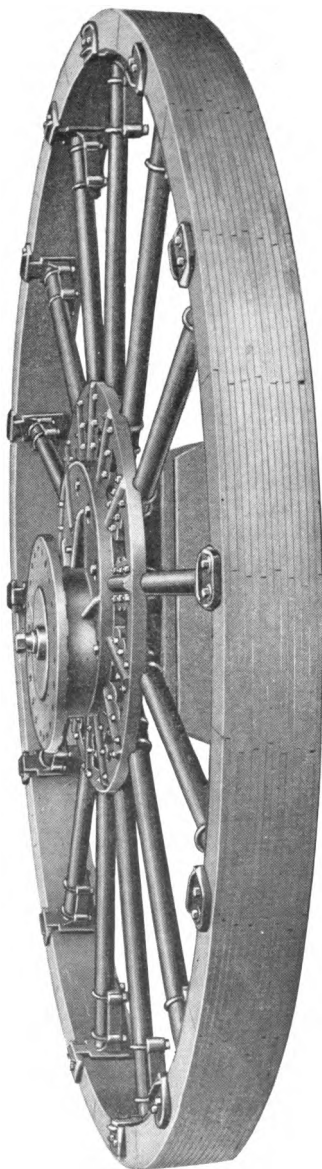
## SURFACE EQUIPMENT FOR PUMPING WELLS

### THE 20TH CENTURY PUMPING POWER

Is a band wheel power, built low to the ground, having but three working bearings, no babbit or keys. These bearings rotate constantly in a pool of oil. The main or bottom bearing is fitted with a ball-bearing constructed of case-hardened plates and 1½-inch tool steel balls.

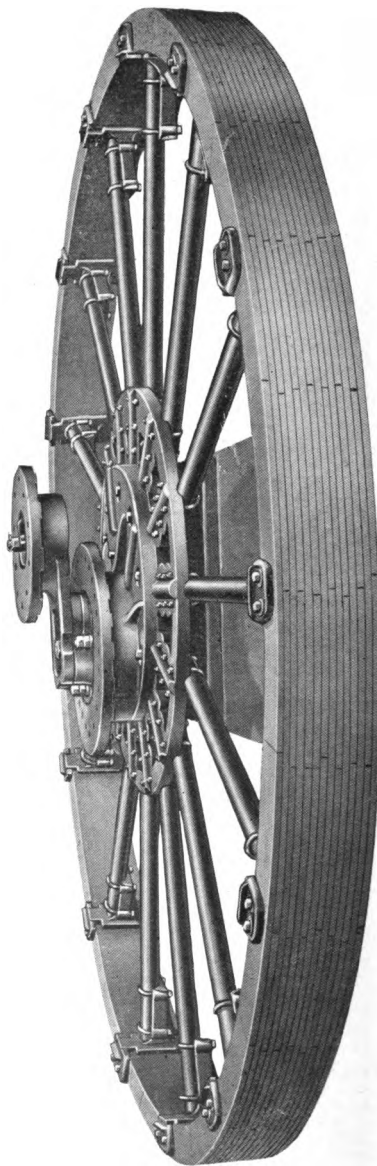
**SINGLE DISC POWER, Fig. 3345**

Capacity, 22 Wells. Weight, 9,500 lbs. Price - - - \$460 00



**DOUBLE DISC POWER, Fig. 3346**

Capacity, 32 Wells. Weight, 10,000 lbs. Price - - - \$490 00

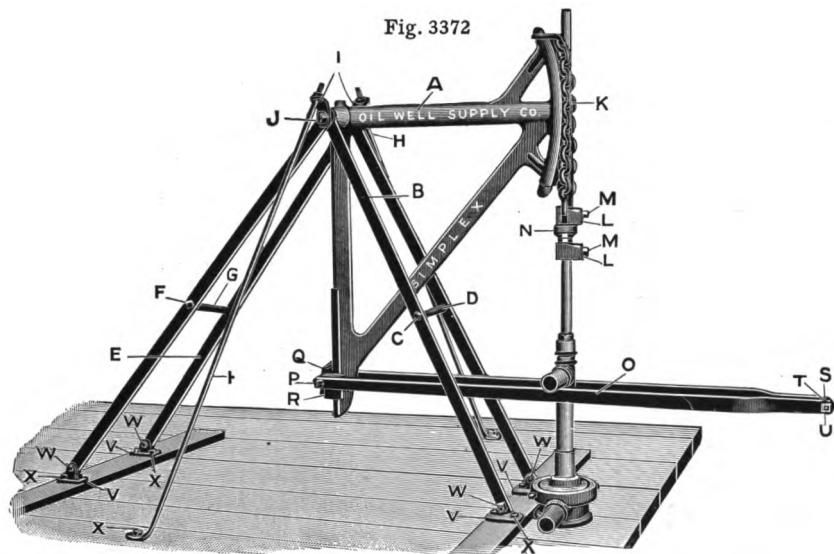


One Gem Belt Tightener is included with each Power.

## SURFACE EQUIPMENT FOR PUMPING WELLS

## SIMPLEX PUMPING JACK

Fig. 3372



Absolutely a straight-pull jack through entire stroke. No lateral strain on polished rod.

No. 1—Suitable for wells 1,200 feet in depth, weight, 365 lbs. - - - - - \$15 00  
 No. 2—Heavy, suitable for wells of any depth, weight, 495 lbs. - - - - - 25 00

## PARTS FOR No. 1

|                                          |             |        |
|------------------------------------------|-------------|--------|
| A—One V or frame                         | - - - each, | \$8 25 |
| B—Two front braces                       | - - - each, | 1 10   |
| C—One front brace spreader bolt, each,   |             | 10     |
| D—One front brace spreader nipple,       | - - - each, | 15     |
| E—Two rear braces                        | - - - each, | 1 25   |
| F—One rear brace spreader bolt, each,    |             | 10     |
| G—One rear brace spreader nipple, each,  |             | 15     |
| H—Two side braces                        | - - - each, | 30     |
| I—Two side brace brackets                | - - - each, | 10     |
| J—One main bearing pin complete,         | - - - each, | 50     |
| K—One set lift chains complete, per set, |             | 1 50   |
| L—Two Acme polished rod clamps, each,    |             | 25     |
| M—Four Acme polished rod clamp bolts     | - - - each, | 10     |
| N—One polished rod lifting flange, each, |             | 20     |
| O—Two pull straps                        | - - - each, | 75     |
| P—One pull strap pin                     | - - - each, | 50     |
| Q—One pull strap adjuster                | - - - each, | 75     |
| R—One pull strap adjuster set screw,     | - - - each, | 10     |
| S—One pull strap spool                   | - - - each, | 10     |
| T—One pull strap spool nipple            | - - - each, | 10     |
| U—One pull strap spool bolt              | - - - each, | 10     |
| V—Four brace castings                    | - - - each, | 20     |
| W—Four brace casting bolts               | - - - each, | 05     |
| X—Ten lag screws                         | - - - each, | 05     |

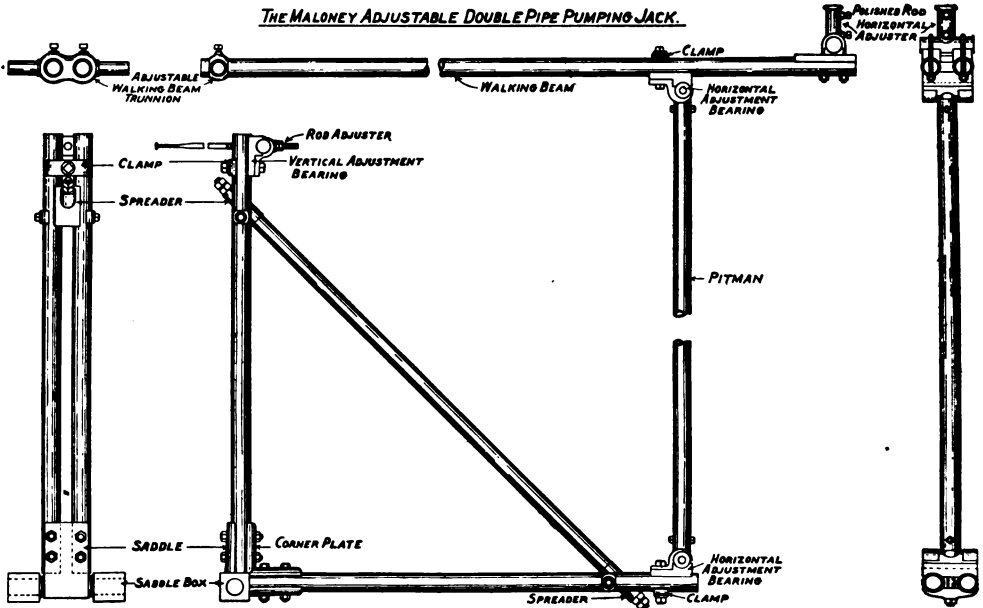
## PARTS FOR No. 2

|                                          |             |         |
|------------------------------------------|-------------|---------|
| A—One V or frame                         | - - - each, | \$10 50 |
| B—Two front braces                       | - - - each, | 1 50    |
| C—One front brace spreader bolt, each,   |             | 10      |
| D—One front brace spreader nipple,       | - - - each, | 15      |
| E—Two rear braces                        | - - - each, | 1 75    |
| F—One rear brace spreader bolt, each,    |             | 15      |
| G—One rear brace spreader nipple, each,  |             | 20      |
| H—Two side braces                        | - - - each, | 50      |
| I—Two side brace brackets                | - - - each, | 10      |
| J—One main bearing pin complete,         | - - - each, | 1 00    |
| K—One set lift chains complete, per set, |             | 2 50    |
| L—Two Acme polished rod clamps, each,    |             | 20      |
| M—Four Acme polished rod clamp bolts     | - - - each, | 10      |
| N—One polished rod lifting flange, each, |             | 20      |
| O—Two pull straps                        | - - - each, | 1 00    |
| P—One pull strap pin                     | - - - each, | 50      |
| Q—One pull strap adjuster                | - - - each, | 75      |
| R—One pull strap adjuster set screw,     | - - - each, | 10      |
| S—One pull strap spool                   | - - - each, | 10      |
| T—One pull strap spool nipple            | - - - each, | 10      |
| U—One pull strap spool bolt              | - - - each, | 10      |
| V—Four brace castings                    | - - - each, | 50      |
| W—Four brace casting bolts               | - - - each, | 05      |
| X—Eighteen lag screws                    | - - - each, | 05      |

## SURFACE EQUIPMENT FOR PUMPING WELLS

### MALONEY PUMPING JACK

Fig. 3357



Rear, Side and Front Elevations.

Made of WROUGHT IRON PIPE, doubled in all parts where strength is required, and held in position with castings and machine bolts.

### IT IS THE STRONGEST PUMPING JACK MADE

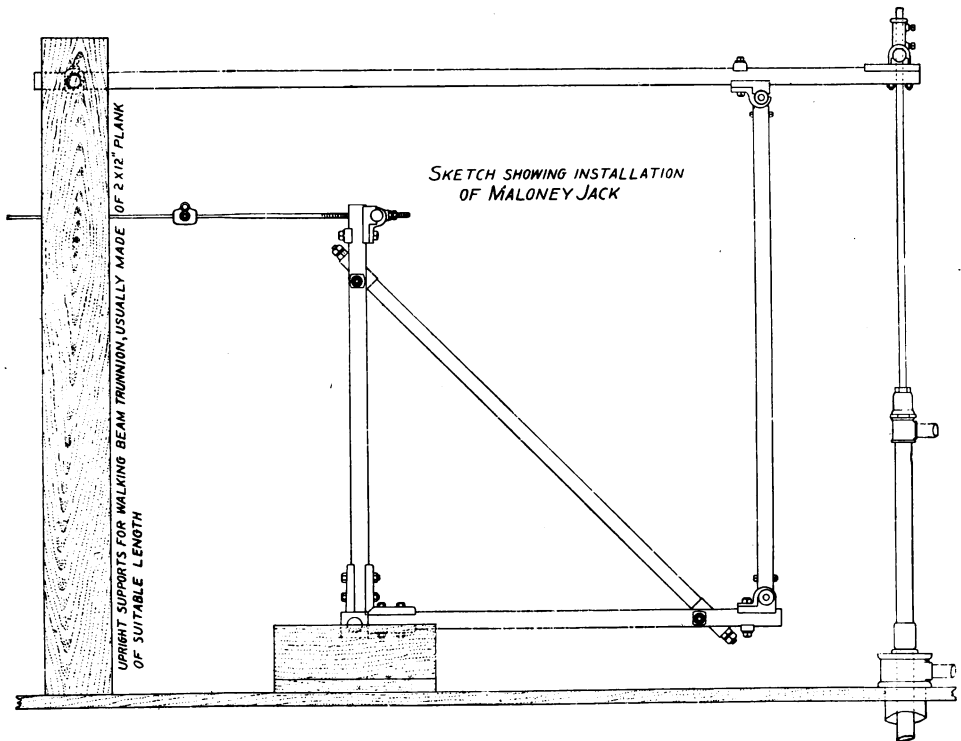
They are so simple in construction that should any part be broken repairs can be made by any lease hand without going to a machine shop. Can be quickly adjusted in either direction, vertically or horizontally, as shown in above illustration.

The expansion and contraction of iron rods is entirely overcome by using the Rod Adjuster or Take-up-screw.

## SURFACE EQUIPMENT FOR PUMPING WELLS

## MALONEY PUMPING JACK

**Fig. 3358**



SKETCH SHOWING INSTALLATION  
OF MALONEY JACK

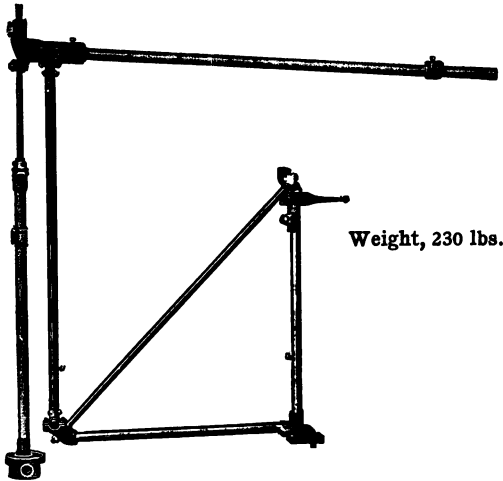
|                 |           |          |
|-----------------|-----------|----------|
| Shipping weight | - - - - - | 440 lbs. |
| Price, each     | - - - - - | \$15 00  |



SURFACE EQUIPMENT FOR PUMPING WELLS

O. K. PUMPING JACK—OVER-PULL

Fig. 3360



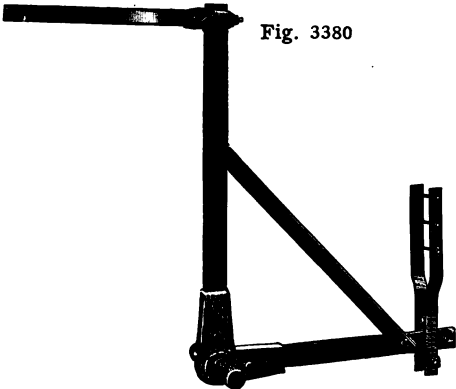
Weight, 230 lbs.

O. K. Jack, complete - - - - - \$15 00

PARTS

|                                |         |                                   |        |
|--------------------------------|---------|-----------------------------------|--------|
| V - - - - (1) - - - - -        | \$11 60 | Pitmans - - - - (2) - each,       | \$0 40 |
| Saddle - - - (1) - - - - -     | 1 55    | Walking-beam casting - (1) - - -  | 3 50   |
| Saddle boxes (2) - - - - each, | 80      | Walking-beam trunnion (1) - - -   | 60     |
| Top casting - (1) - - - - -    | 1 30    | Polished rod collar - - (1) - - - | 40     |
| Lift casting - (1) - - - - -   | 1 70    | Adjuster - - - - - (1) - - -      | 70     |

Fig. 3380



PAOVA PUMPING JACK

For wells ranging in depth from 600 to 1,500 feet.

When ordering specify connections, whether for iron rods, wood rods, or wire strand.

Weight, 180 lbs.

Price - - - - - \$8 00

HUDSON UNDER-PULL PUMPING JACK

Complete for 2-inch tubing - - - Weight, 355 pounds - - - - - \$15 00

HUDSON OVER-PULL PUMPING JACK

Complete for 2-inch tubing - - - Weight, 313 pounds - - - - - \$15 00

SWAN PUMPING JACK

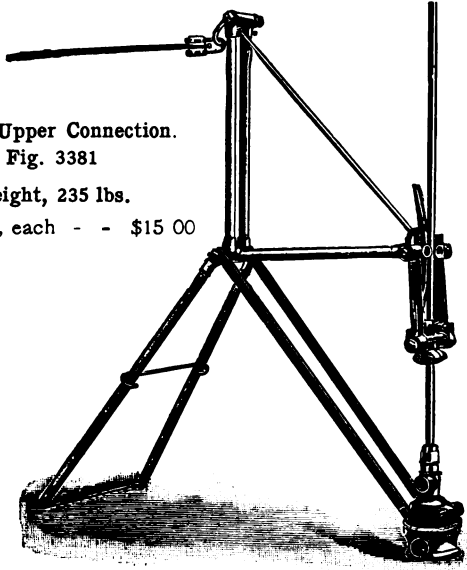
Price - - - - - \$15 00

# **SURFACE EQUIPMENT FOR PUMPING WELLS** **JONES & HAMMOND PUMPING JACKS**

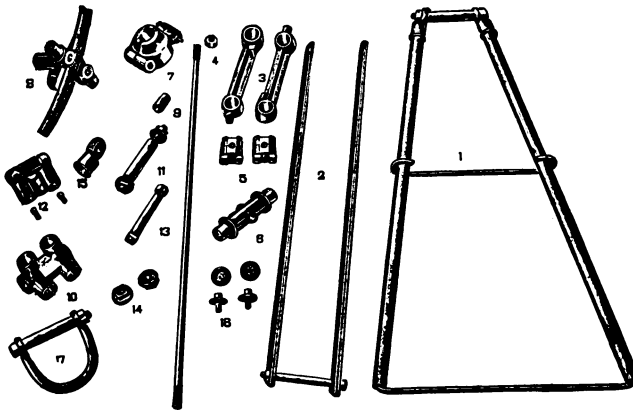
**No. 1 Upper Connection.**  
**Fig. 3381**

**Weight, 235 lbs.**

**Complete, each - - \$15 00**



**PARTS. Fig. 3382**

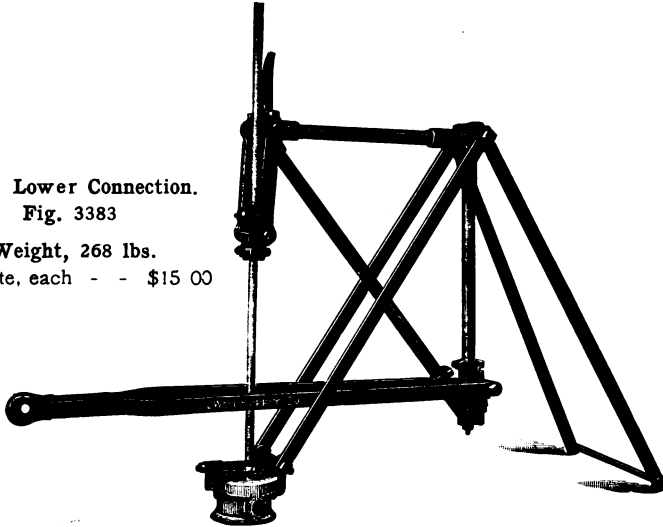


|                                                                                                    |        |                                      |        |
|----------------------------------------------------------------------------------------------------|--------|--------------------------------------|--------|
| No. 1—Back brace, complete - -                                                                     | \$3 00 | No. 9—Stay rod nut - - - -           | \$0 20 |
| No. 2—Front brace, complete - -                                                                    | 2 00   | No. 10—Corner casting - - - -        | 1 00   |
| No. 3—Side arms - - - - each                                                                       | 75     | No. 11—Trunnion pin, complete - -    | 1 00   |
| No. 4—Stay rod - - - -                                                                             | 75     | No. 12—Stirrup box - - - -           | 75     |
| No. 4a—Stay-rod nut - - - -                                                                        | 15     | No. 13—Bolt and sleeve for stirrup - | 25     |
| No. 5—Polish rod clamps- - each                                                                    | 30     | No. 14—Nuts for trunnion pin, each   | 15     |
| No. 6—Adjuster bar - - - -                                                                         | 1 00   | No. 15—Pipe socket for back brace -  | 20     |
| No. 7—Tubing clamp - - - -                                                                         | 1 50   | No. 16—Side-arm nuts - - - each      | 15     |
| No. 8—Arc - - - -                                                                                  | 2 50   | No. 17—Stirrup - - - -               | 60     |
| <b>No. 3 Jones &amp; Hammond Pumping Jack, extra heavy, for 2½ and 3-inch tubing, each \$25 00</b> |        |                                      |        |
| <b>Weight, 450 lbs.</b>                                                                            |        |                                      |        |

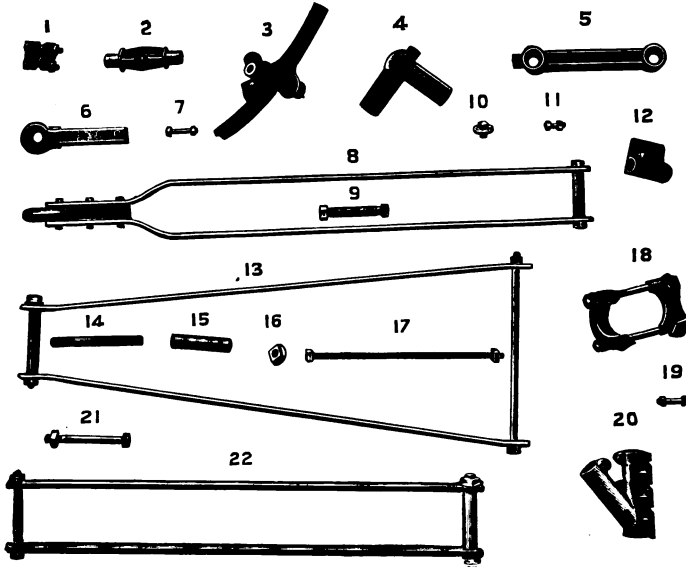
# **SURFACE EQUIPMENT FOR PUMPING WELLS** **JONES & HAMMOND PUMPING JACKS**

**No. 2 Lower Connection.**  
**Fig. 3383**

**Weight, 268 lbs.**  
**Complete, each - - \$15 00**



**PARTS. Fig. 3384**

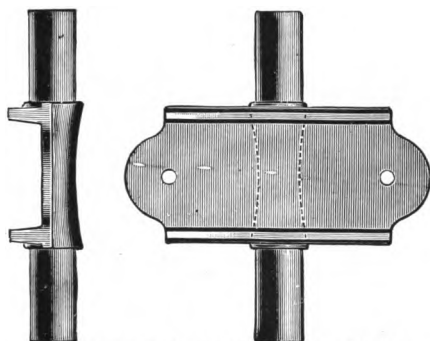


|                                                 |        |
|-------------------------------------------------|--------|
| No. 1—Polished rod clamps, each - - -           | \$0 30 |
| No. 2—Adjuster bar - - - - -                    | 1 00   |
| No. 3—Arc - - - - -                             | 2 50   |
| No. 4—Corner casting - - - - -                  | 1 25   |
| No. 5—Side arms, each - - - - -                 | 75     |
| No. 6—Pull rod connection - - - - -             | 50     |
| No. 7—Bolts for pull rod connection, each - - - | 05     |
| No. 8—Long stirrup side irons - - - - -         | 2 00   |
| No. 9—Bolt and sleeve for long stirrup - - -    | 30     |
| No. 10—Side arm nuts, each - - - - -            | 15     |
| No. 11—Bolts for stirrup box, each - - - - -    | 05     |
| No. 12—Stirrup box - - - - -                    | 60     |

|                                                           |        |
|-----------------------------------------------------------|--------|
| No. 13—Back braces - - - - -                              | \$2 50 |
| No. 14—Bolt for trunnion pin - - - - -                    | 25     |
| No. 15—Sleeve for trunnion pin - - - - -                  | 25     |
| No. 16—Nuts for trunnion pin, each - - - - -              | 15     |
| No. 17— $\frac{1}{2}$ x 24" bolt for rear brace - - - - - | 30     |
| No. 18—Casing head clamp castings - - - - -               | 1 00   |
| No. 18A—bolts, each - - - - -                             | 15     |
| No. 19—Bolts for V castings, each - - - - -               | 05     |
| No. 20—V casting - - - - -                                | 1 50   |
| No. 21—Bolt for front brace - - - - -                     | 15     |
| No. 22—Front braces - - - - -                             | 2 00   |

## SURFACE EQUIPMENT FOR PUMPING WELLS

V SADDLE—Fig. 3500



Weights—6-inch, 51 lbs.; 8-inch, 74 lbs.

90° SADDLE—Fig. 3505

Ajax pattern  
Weight, 51 lbs.

SADDLE BOX

Fig. 3501



Weight, 7 lbs.

MALONEY SADDLE BOX

Fig. 3501-A

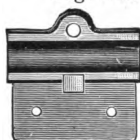


Weight, 10 lbs.

| Size                              | inches | 6      | 8    | 6 Half | 6 Ohio | 6 Harmony | 8 Harmony |
|-----------------------------------|--------|--------|------|--------|--------|-----------|-----------|
| V saddles, fig. 3500              |        | \$4 30 | 5 40 | 3 60   | 3 40   | 5 50      | 6 50      |
| V saddle boxes, fig. 3501         |        | 50     | 50   |        | 50     | 75        |           |
| Maloney saddle boxes, fig. 3501-A |        | 90     | 90   |        |        |           |           |
| 90° saddles, fig. 3505            |        | 4 75   |      |        |        | 6 50      |           |

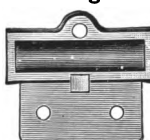
OPEN STIRRUP BOX

Fig. 3502



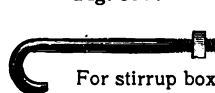
CLOSED STIRRUP BOX

Fig. 3503



HOOK BOLT

Fig. 3504



For stirrup box

Weights—4-inch, 5 lbs.; 6-inch, 7 lbs.; 8-inch, 17 lbs.;  
10-inch, 22 lbs.

Weights—4-inch, 7 lbs.; 6-inch, 9 lbs.; 8-inch, 19 lbs.;  
10-inch, 24 lbs.

## STIRRUP BOXES—Figs. 3502-3503

When ordering, state whether wanted for stirrups made of flat or round iron

| Size stirrup for | inches                          | 4      | 4      | 6     | 6            | 6     | 6   | 8     | 8     | 8     | 8    | 10    |
|------------------|---------------------------------|--------|--------|-------|--------------|-------|-----|-------|-------|-------|------|-------|
| Open ends        | Size bearing                    | 1 1/4  | 1 1/2  | 1 1/4 | 1 1/4, 1 1/2 | 1 1/4 | 2   | 1 1/4 | 1 1/2 | 1 1/4 | 2    | 1 1/4 |
|                  | Price each                      | ---    | \$0 35 | 40    | 45           | 55    | 80  | 80    | ---   | 1 00  | 1 05 | 1 00  |
|                  | With lug                        | ---    | ---    | 55    | 60           | ---   | 90  | ---   | 80    | ---   | 1 20 | ---   |
| Closed ends      | For round iron stirrups         | ---    | 75     | 80    | 95           | ---   | --- | 1 00  | ---   | ---   | ---  | ---   |
|                  | For flat iron stirrups          | ---    | 60     | ---   | 80           | 85    | --- | ---   | ---   | ---   | ---  | ---   |
|                  | For flat iron stirrups with lug | \$0 55 | 60     | ---   | 85           | ---   | --- | ---   | ---   | ---   | ---  | ---   |

## HOOK BOLTS—Fig. 3504

| Size  | inches | 5/8 x 8 | 5/8 x 12 | 3/4 x 8 | 3/4 x 10 | 3/4 x 13 | 1 1/4 x 10 |
|-------|--------|---------|----------|---------|----------|----------|------------|
| Price |        | \$0 30  | 40       | 35      | 45       | 50       | 80         |

## EQUALIZER STRAP—Fig. 3571



Ajax pattern

Equalizer straps, O. W. S. Co., no bolts, fig.

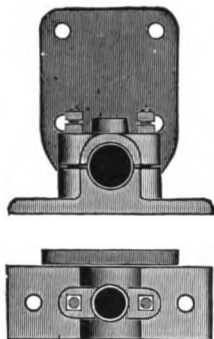
3571 - - - - - per set (2) \$1 00

Equalizer straps, St. Mary's pattern, per set (2) 4 00

Weight, per set (2), 17 lbs.

## SURFACE EQUIPMENT FOR PUMPING WELLS

**SWING POST CASTINGS**  
Fig. 3506



Ajax pattern  
Weight per set, 78 pounds.  
Per set (2) - - - \$6 50  
Boxes and bolts, complete - - - each, 1 75  
Side arms - - - each, 1 50

**SAGE ROCKER**  
Fig. 3498



Weight, 50 pounds.

Price, 6-inch - - - - \$4 50

**SAGE ROCKER BOX**

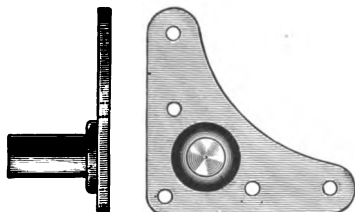


Fig. 3499

Weight, 5 Pounds

Price - - - - \$0 60

**L GUDGEON**  
Fig. 3507

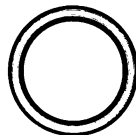


Weight, 27 pounds.

L gudgeons, fig. 3507 - - - per set, \$4 00

L gudgeons, fig. 3507, with bolts, per set, 4 50

**ROUND IRON RING**  
Fig. 3559



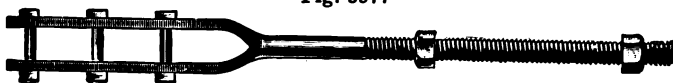
| Diameter iron, inches | 1      | 1½   | 1¾   | 2    |
|-----------------------|--------|------|------|------|
| Price - - - -         | \$1 00 | 1 25 | 1 25 | 2 00 |

**LINK CONNECTION**  
Fig. 3430



|                                  |         |       |       |
|----------------------------------|---------|-------|-------|
| Size iron in straps - - - inches | 2½ x ⅝  | 3 x ¾ | 4 x ¾ |
| Size iron in links - - - inches  | 1½      | 1½    | 1½    |
| Weight per set - - - lbs.        | 160     | 275   | 375   |
| Per set (2) - - - -              | \$15 00 | 21 75 | 32 80 |

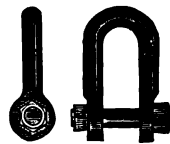
**STRAIN BOLT FOR WOOD CONNECTING RODS**  
Fig. 3577



Weight, 15 pounds.

Price - - - - - \$3 50

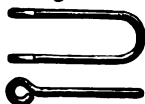
**CLEVIS FOR POWER**  
Fig. 3566



Ajax pattern

Weight, 8 pounds.  
Price - - - \$2 25

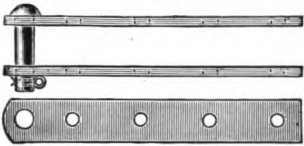
**SWING CLEVIS FOR WOOD RODS**  
Fig. 3575



Price - - - \$1 00

SURFACE EQUIPMENT FOR PUMPING WELLS

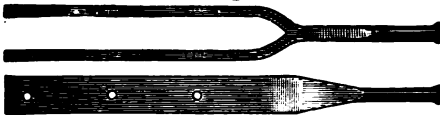
STRAPS FOR CONNECTING WOODEN  
RODS TO ECCENTRIC POWER OR  
O. K. PUMPING JACK—Fig. 3561



Weight, 14 pounds.

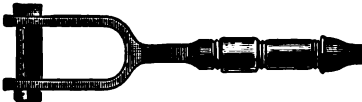
Price - - - - - \$1 65

CONNECTION FROM WOOD TO IRON  
RODS—Fig. 3574



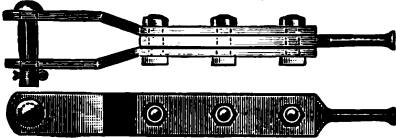
Price - - - - - \$1 85

YOKE FOR CONNECTING WIRE ROPE  
TO O. K. PUMPING JACK—Fig. 3563



Weight, 12 pounds.

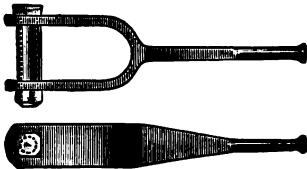
ECCENTRIC STRAP AND IRON ROD  
CONNECTION—Fig. 3565



Weight, 20 pounds.

Price - - - - - \$2 85

YOKE FOR CONNECTING IRON RODS  
TO O. K. PUMPING JACK—Fig. 3562



Weight, 10 pounds.

YOKE FOR CONNECTING WIRE ROPE  
TO ECCENTRIC PUMPING POWER  
Fig. 3564



Weight, 12 pounds.

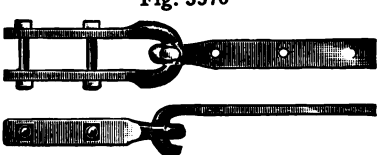
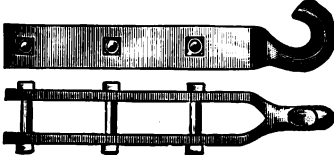
|                                                    |                                 |                                 |                 |      |
|----------------------------------------------------|---------------------------------|---------------------------------|-----------------|------|
| Yokes, fig. 3562 - - - - - size, inches            | $\frac{3}{8}$ and $\frac{1}{2}$ | $\frac{3}{4}$ and $\frac{1}{2}$ | $\frac{7}{8}$   | 1    |
| Price - - - - -                                    | \$1 75                          | 1 75                            | 2 35            | 2 50 |
| Yokes, figs. 3563, 3564; size pipe thread - inches | 1                               | 1 $\frac{1}{4}$                 | 1 $\frac{1}{2}$ | Pins |
| Price - - - - -                                    | \$2 70                          | 2 70                            | 2 70            | 25   |

LIST

D, STIRRUP HOOK—Fig. 3569  
Also made with Clevis

DISCONNECTING CLEVIS AND HOOK  
Fig. 3570

- $\frac{1}{2}$ x18" Hook, \$2 80
- " Clevis, 2 50
- $\frac{3}{4}$ x18" Hook, 3 35
- " Clevis, 3 00
- $\frac{1}{2}$ x2 $\frac{1}{2}$ " Hook, 4 75
- " Clevis, 3 60



Weight, 10 pounds.

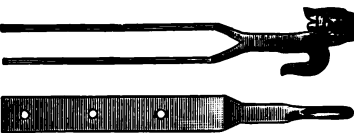
Weight, 8 pounds.

Price - - - - - \$2 85

Price - - - - - \$3 00

DISCONNECT-  
ING HOOK  
Fig. 3568

STRAP WITH DOUBLE HOOK AND CHAINS FOR CONNECTION  
FROM WOOD TO IRON RODS—Fig. 3572



2 pieces chain, 2 feet long each.

Weight, 31 pounds.

Weight, 6 pounds.

Price - - \$3 00

Price - - - - - \$3 75

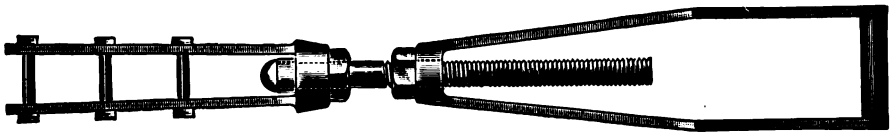
HOOK FOR IRON ROD CLAMP  
Fig. 3573



Weight, 5 pounds.

Price - - - - - \$1 40

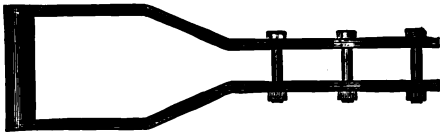
SURFACE EQUIPMENT FOR PUMPING WELLS



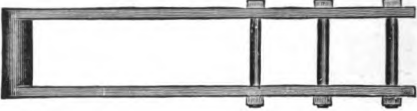
SWIVEL STIRRUP—Fig. 3537

|                                  |   |        |        |         |       |       |       |       |       |
|----------------------------------|---|--------|--------|---------|-------|-------|-------|-------|-------|
| Swivel stirrups, fig. 3537; size | - | inches | 6      | 6       | 8     | 8     | 8     | 10    | 12    |
| Size of screw                    | - | -      | -      | -       | -     | -     | -     | -     | -     |
| Weight                           | - | -      | -      | -       | -     | -     | -     | -     | -     |
| Price                            | - | -      | -      | -       | -     | -     | -     | -     | -     |
|                                  |   |        | inches | 1 1/2   | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 2     |
|                                  |   |        | lbs.   | 62      | 64    | 70    | 72    | 74    | 80    |
|                                  |   |        |        | \$12 00 | 13 50 | 16 75 | 23 00 | 26 75 | 28 25 |
|                                  |   |        |        |         |       |       |       |       | 39 00 |

STIRRUP FOR WOOD RODS—Fig. 3521



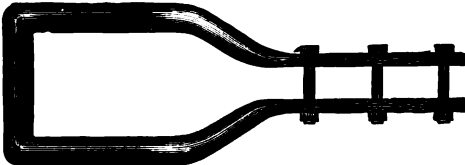
STRAIGHT STIRRUP—Fig. 3525



SIDE STIRRUP—Fig. 3522



ROUND IRON STIRRUP—Fig. 3532



Made in all forms and sizes as flat iron stirrups shown.

REGULAR STIRRUPS FOR WOOD RODS

|                                          |        |      |      |      |      |      |      |      |      |
|------------------------------------------|--------|------|------|------|------|------|------|------|------|
| Size.....inches                          | 4x2    | 4x4  | 6x2  | 6x4  | 6x6  | 8x2  | 8x4  | 10x2 | 10x4 |
| Flat iron, figs. 3521 to 3525,           |        |      |      |      |      |      |      |      |      |
| size iron 1 1/2 x 1/2.....               | \$1 75 | 1 75 | 2 00 | 2 00 | 2 00 | 2 25 | 2 25 | 3 00 | 3 00 |
| Heavy stirrups, size iron 2 x 3/4.....   | ....   | .... | 3 00 | 3 00 | 3 00 | 4 00 | 4 00 | 5 00 | 5 00 |
| Ex. hy. stirrups, size iron 2 x 3/4..... | ....   | .... | 4 00 | 4 00 | 4 00 | 5 00 | 5 00 | 6 00 | 6 00 |
| Double extra heavy stirrups,             |        |      |      |      |      |      |      |      |      |
| size iron 2 1/2 x 3/4.....               | ....   | .... | 5 50 | 5 50 | 5 50 | 6 50 | 6 50 | 7 50 | 7 50 |
| Round iron, fig. 3532, size 1 1/2.....   | 2 25   | 2 25 | 2 50 | 2 50 | 2 50 | 2 75 | 2 75 | .... | .... |
| Round iron, fig. 3532, size 1.....       | ....   | .... | 3 25 | 3 25 | 3 25 | 4 25 | 4 25 | .... | .... |
| Round iron, fig. 3532, size 1 1/4.....   | ....   | .... | .... | .... | .... | .... | .... | 7 00 | 7 00 |

APPROXIMATE WEIGHT OF STIRRUPS, LBS.

|                                |    |    |    |    |
|--------------------------------|----|----|----|----|
| Size - - - - - inches          | 4  | 6  | 8  | 10 |
| Made 1 1/2 x 1/2-inch iron - - | 14 | 15 | 16 | 18 |
| Made 2 x 3/4-inch iron - -     | 23 | 25 | 27 | 29 |
| Made 2 x 3/4-inch iron - -     | 28 | 30 | 32 | 34 |
| Made 2 1/2 x 3/4 inch iron - - | 32 | 34 | 36 | 38 |
| Made 1 1/4-inch round iron - - | 23 | 25 | 27 | 29 |
| Made 1 1/2-inch round iron - - | 33 | 35 | 37 | 39 |
| Made 1 3/4-inch round iron - - | 45 | 47 | 49 | 51 |

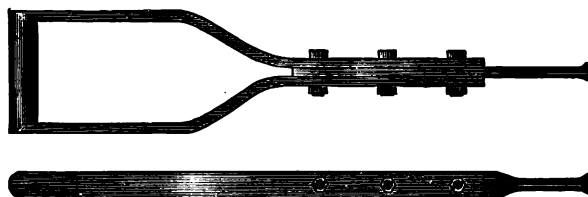
C, OR DISCONNECTING LINK Fig. 3567



|              |        |    |       |       |       |
|--------------|--------|----|-------|-------|-------|
| Size, inches | 7/8    | 1  | 1 1/8 | 1 1/4 | 1 1/2 |
| Weight, lbs. | 5      | 7  | 9     | 11    | 14    |
| Price - -    | \$0 45 | 50 | 60    | 75    | 1 15  |

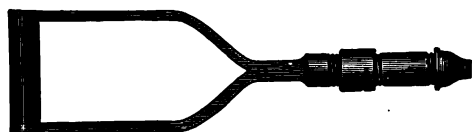
# **SURFACE EQUIPMENT FOR PUMPING WELLS**

## **STIRRUP WITH IRON ROD CONNECTION—Fig. 3529**



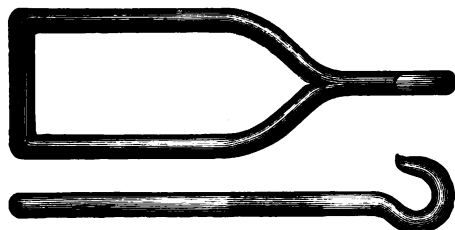
Also made of round iron

## **STIRRUP FOR CONNECTING TO WIRE ROPE** Fig. 3531



Also made of round iron and with center piece connection for wire rope

## **HOOK STIRRUP—Fig. 3535**

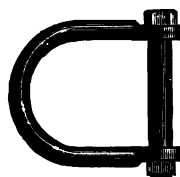


## **STIRRUP FOR CONNECTING TO SUCKER RODS—Fig. 3536**



Made with either box or pin. Also made of round iron and with box or pin center piece

## **STIRRUP—Fig. 3528**



Ajax pattern

## **STIRRUPS FOR IRON RODS AND WIRE ROPE**

| Size stirrup                                                                                                                                                                                                   | 4      | 6    | 8    | 10   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|------|------|
| Flat iron, with center piece, fig. 3529 - - size iron $1\frac{1}{2} \times \frac{1}{2}$ inches                                                                                                                 | \$1 75 | 2 00 | 2 50 | 3 60 |
| Flat iron, with center piece, fig. 3529 - - size iron $2 \times \frac{3}{8}$ inches                                                                                                                            | ----   | 2 75 | 3 25 | 4 15 |
| Flat iron, with center piece, fig. 3529 - - size iron $2 \times \frac{1}{2}$ inches                                                                                                                            | ----   | 3 50 | 4 50 | 5 90 |
| Flat iron, with center piece, fig. 3529 - - size iron $2\frac{1}{2} \times \frac{3}{4}$ inches                                                                                                                 | ----   | 5 00 | 6 25 | 7 65 |
| Round iron, with center piece, not illustrated, size iron $1\frac{1}{4}$ inches                                                                                                                                | 2 25   | 2 50 | ---- | 6 50 |
| Round iron, with center piece, not illustrated, size iron $1\frac{1}{2}$ inches                                                                                                                                | 2 75   | 5 50 | 6 50 | 7 00 |
| Round iron, with center piece, not illustrated, size iron $1\frac{3}{4}$ inches                                                                                                                                | ----   | ---- | ---- | 7 75 |
| For connecting to wire rope, iron or wood sucker rods, or with $1\frac{1}{4}$ -inch pipe thread, made of $\frac{1}{2} \times 1\frac{1}{2}$ inch flat iron or $1\frac{1}{4}$ -inch round iron, figs. 3531, 3536 | 2 00   | 2 75 | 3 25 | 4 00 |
| Ajax stirrups, fig. 3528                                                                                                                                                                                       | 2 00   | 2 50 | 3 00 | 3 50 |
| Ajax stirrups, fig. 3528 - - - - - weight, lbs.                                                                                                                                                                | 10     | 12   | 13   | 15   |

Hook stirrups,  $1\frac{1}{4}$ -inch round iron, fig. 3535, weight 17 lbs. - - - - - \$3 50

## **STIRRUP CENTER PIECES ONLY**

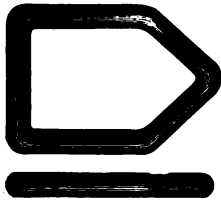
| Size rod for                                     | $\frac{1}{4}$ " | $\frac{3}{8}$ " | $\frac{1}{2}$ " | $\frac{3}{4}$ " |
|--------------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| Weight - - - - - lbs.                            | 3               | 3               | 4               | 6               |
| As shown with fig. 3529 - - - - -                | \$0 50          | 50              | 50              | 50              |
| For Ajax rods, see fig. 3604, page 259 - - - - - | ----            | 70              | 70              | 70              |

For approximate weight of stirrups, see page 254.  
The foregoing lists on stirrups include the bolts.

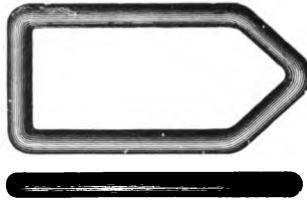


# **SURFACE EQUIPMENT FOR PUMPING WELLS**

**SHORT D STIRRUP**  
Fig. 3526



**LONG D STIRRUP**  
Fig. 3527



**COMBINATION  
CLAMP  
CONNECTION**

Fig. 3560



Weight, 5 to 8 lbs., each

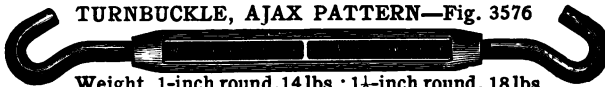
Made of any size, round iron desired

| D stirrups, figs. 3526, 3527; size, inches | 6 x 8  | 6x10 | 6x12 | 6x8  | 6x10 | 6x12 | 6x10 | 6x12 | 8x12 | 6x10 | 6x12 |
|--------------------------------------------|--------|------|------|------|------|------|------|------|------|------|------|
| Size of iron - - - - - inches              | 1      | 1    | 1    | 1½   | 1½   | 1½   | 1½   | 1½   | 1½   | 1½   | 1½   |
| Weight - - - - - lbs.                      | 8      | 9    | 10   | 9    | 10   | 11   | 11   | 13   | 15   | 20   | 22   |
| Price - - - - -                            | \$1 15 | 1 20 | 1 50 | 1 30 | 1 45 | 1 85 | 1 70 | 2 00 | 2 25 | 1 85 | 2 15 |

| Combination clamps, fig. 3560; size, inches | ½      | ¾  | 1  | 1½   | 2  | 2½ | 3  | 4    | 5  | 6  | 8  |
|---------------------------------------------|--------|----|----|------|----|----|----|------|----|----|----|
| Length - - - - - inches                     | 9      | 9  | 9  | 9    | 16 | 16 | 16 | 16   | 16 | 16 | 16 |
| Price - - - - -                             | \$0 70 | 85 | 85 | 1 00 | 80 | 95 | 95 | 1 10 | 35 | 45 | 45 |

**TURNBUCKLE, AJAX PATTERN—Fig. 3576**



Weight, 1-inch round, 14 lbs.; 1½-inch round, 18 lbs.

**TURNBUCKLE WITH STUB ENDS—Fig. 3538**



| Size - - - - - inches                            | ½      | ¾    | 1    | 1½   |
|--------------------------------------------------|--------|------|------|------|
| Turnbuckles, fig. 3576 - - - - -                 | \$1 85 | 3 00 | 4 50 | 5 00 |
| Turnbuckles, with stub ends, fig. 3538 - - - - - | -----  | 2 25 | 3 75 | 4 25 |

## **THROW-OFF HOOKS**

**VENEDOCIA STYLE**  
Fig. 3547



Weight, 3.3 lbs.

Price - - - - - \$2 00

**FINDLAY STYLE**  
Fig. 3551



Weight, 2 lbs.

Price, set - - - - - \$1 20

**DISCONNECTING HOOK—Fig. 3545**



For ½ or ¾-inch iron pull rods

Weight, 2.5 lbs.

Price - - - - - \$2 00

**PRAIRIE DEPOT STYLE**  
Fig. 3548



Price, 1½-in., wt. 10 lbs. \$1 50

Price, 1½-in., wt. 16 lbs. 3 00

**1½-INCH SINGLE PIPE, GENEVA STYLE—Fig. 3550**



Weight, 4.7 lbs.

**DISCONNECTING STIRRUP—Fig. 3546**



For ½ or ¾-inch iron pull rods

Weight, 2.5 lbs.

Price - - - - - \$3 00

**1½-INCH DOUBLE PIPE,  
GENEVA STYLE**  
Fig. 3549



Weight, 6.2 lbs.

Price - - - - - \$3 75

## SURFACE EQUIPMENT FOR PUMPING WELLS

TAKE-UP SCREW FOR IRON RODS—Fig. 3578



Weight, 16 pounds.

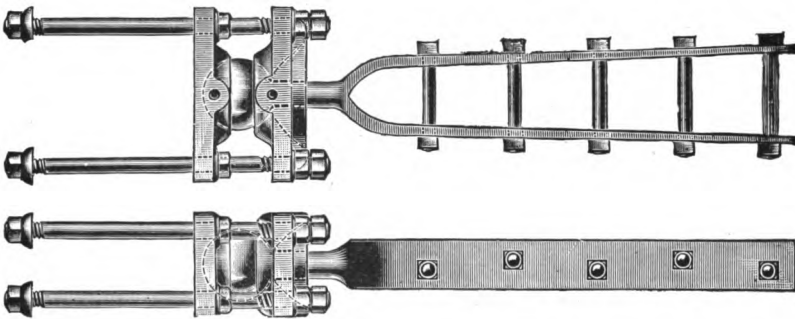
TAKE-UP SCREW FOR WIRE ROPE—Fig. 3579



Weight, 18 pounds.

|                                                                 |               |               |               |       |
|-----------------------------------------------------------------|---------------|---------------|---------------|-------|
| Take-up screws for iron rods, fig. 3578, size rod - - - inches  | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1     |
| Price - - - - -                                                 | \$10 25       | 10 25         | 14 00         | 14 00 |
| Take-up screws for wire rope, fig. 3579, size rope - - - inches | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1     |
| Price - - - - -                                                 | \$13 75       | 13 75         | 18 25         | 18 25 |

BALL JOINT—Fig. 3580



|                                               |         |       |       |
|-----------------------------------------------|---------|-------|-------|
| Ball joints, fig. 3580, size - - - - - inches | 4       | 5     | 6     |
| Weight each - - - - - lbs.                    | 96      | 159   | 300   |
| Price - - - - -                               | \$19 75 | 28 50 | 46 00 |

PIPE EYE—Fig. 3613



Made in all sizes

WIRE ROPE CLIP—Fig. 3614



Made in all sizes

COLLAR FOR PIPE SWING

POST—Fig. 3612



Price, 2 inch - - \$0 35

|                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   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| Pipe eyes or hooks, size | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - 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SURFACE EQUIPMENT FOR PUMPING WELLS  
WOOD CONNECTING RODS AND STRAPS

Fig 3400.



1½-inch x 2½-inch rods - - - - - per foot, \$ - - -  
2 -inch x 3 -inch rods - - - - - per foot, - - -

These rods are used to connect wells so they can be pumped by one engine. Many wells may be coupled together, though thousands of feet apart. The rods are of ash, from 20 to 25 feet long, and are united by straps fastened to the rods by bolts and nuts.

2-INCH X 1½-INCH X 30-INCH CONNECTING ROD STRAP  
Fig. 3632



2-INCH X 1½-INCH X 30-INCH CONNECTING ROD STRAP  
Fig 3634.



4-INCH X 1-INCH X 30 INCH CONNECTING ROD STRAP  
Fig. 3638



CONNECTING ROD STRAPS

Made with either round or square holes

|                         |        |      |      |      |      |      |      |      |      |
|-------------------------|--------|------|------|------|------|------|------|------|------|
| Width - - - - inches    | 1½     | 2    | 2    | 2    | 2    | 2    | 2½   | 2½   | 2½   |
| Thickness - - - inches  | ¾      | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    |
| Length - - - - inches   | 22     | 24   | 30   | 24   | 30   | 24   | 28   | 30   | 30   |
| Weight per set - - lbs. | -----  | 6    | 7    | --   | 10   | 12   | 10   | 11   | 12   |
| Per set of two - - - -  | \$0 33 | 43   | 50   | 60   | 63   | 1 00 | 63   | 75   | 80   |
| Width - - - - inches    | 2½     | 3    | 3    | 4    | 4    | 5    | 5    | 5    | 5    |
| Thickness - - - inches  | ¾      | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    | ¾    |
| Length - - - - inches   | 36     | 30   | 30   | 30   | 36   | 30   | 36   | 42   | 48   |
| Weight per set - - lbs. | 14     | 12   | 14   | 18   | 22   | 24   | 27   | 31   | 36   |
| Per set of two - - - -  | \$0 95 | 1 00 | 1 05 | 1 25 | 1 45 | 1 75 | 2 00 | 2 25 | 2 45 |

SPECIAL GALVANIZED PUMPING STAND

Fig. 3401

Used for same purpose as wood connecting rods



|                                |        |      |      |      |      |       |       |       |
|--------------------------------|--------|------|------|------|------|-------|-------|-------|
| Diameter - - - - inches        | ¾      | ¾    | ¾    | ¾    | ¾    | ¾     | ¾     | 1     |
| Seven wires - - - per 100 feet | \$2 55 | 3 20 | 5 20 | 6 60 | 8 50 | 12 00 | 17 00 | 21 50 |
| Weight per 100 feet - - lbs.   | 22     | 30   | 52   | ---  | ---  | ---   | ---   | ---   |

## SURFACE EQUIPMENT FOR PUMPING WELLS

REGULAR IRON CONNECTING OR PULL ROD—Fig. 3603



AJAX IRON CONNECTING OR PULL ROD—Fig. 3604



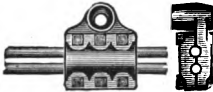
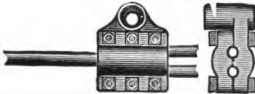
ONE-BOLT ROD CLAMP—Fig. 3607

IRON ROD CLAMP—Fig. 3600



DOUBLE IRON ROD CLAMP—Fig. 3601

IRON ROD CLAMP—Fig. 3602

IRON ROD,  $\frac{3}{4} \times \frac{1}{2}$  INCH  
BRANCH CLAMP  
Fig. 3605K. C. CLAMP FOR SUS-  
PENDING WIRE ROPE  
Fig. 3610CLAMP FOR CARRYING  
IRON RODS OR WIRE  
ROPE—Fig. 3611

| Size - - - - - inches                                         | $\frac{9}{16}$ | $\frac{5}{8}$ | $\frac{11}{16}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1   |
|---------------------------------------------------------------|----------------|---------------|-----------------|---------------|---------------|-----|
| Pull or surface rods, complete, regular, fig. 3603, - - -     | ---            | ---           | ---             | ---           | ---           | --- |
| Pull or surface rods, complete, Ajax, fig. 3604 - - -         | ---            | ---           | ---             | ---           | ---           | --- |
| Pull or surface rods, with 1 bolt clamp, fig. 3607, -         | ---            | ---           | ---             | ---           | ---           | --- |
| Weight of connecting rods per 100 ft., including clamps, lbs. | 90             | 110           | 135             | 155           | 215           | 280 |

## PRICES ON APPLICATION

| Size iron rod and carrying clamps, inches   | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | $\frac{5}{8}$ | $\frac{11}{16}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1    |
|---------------------------------------------|---------------|---------------|----------------|---------------|-----------------|---------------|---------------|------|
| Fig. 3600, heavy, 4 bolt - - - - -          | ---           | ---           | ---            | \$0 70        | 75              | 80            | 90            | ---  |
| Fig. 3601, double, 4 bolt - - - - -         | ---           | \$0 60        | 60             | 65            | 70              | 70            | ---           | ---  |
| Fig. 3601, XX heavy, 6 bolt - - - - -       | ---           | ---           | ---            | ---           | ---             | 1 40          | ---           | ---  |
| Fig. 3602, heavy, 4 bolt - - - - -          | ---           | 70            | 70             | 70            | 75              | 80            | 1 00          | 1 00 |
| Fig. 3602, light, 4 bolt - - - - -          | ---           | ---           | ---            | 60            | 65              | 70            | ---           | ---  |
| Fig. 3605, branch, 4 bolt - - - - -         | ---           | ---           | ---            | 80            | 85              | 85            | ---           | ---  |
| Fig. 3605, XX heavy, 6 bolt - - - - -       | ---           | ---           | ---            | ---           | ---             | 1 40          | ---           | ---  |
| Fig. 3607, 1 bolt, malleable iron - - - - - | ---           | ---           | 45             | 45            | 65              | 65            | ---           | ---  |
| Fig. 3607, 1 bolt, cast iron - - - - -      | ---           | ---           | 40             | 40            | 50              | 50            | ---           | ---  |
| Fig. 3610, K. C. - - - - -                  | \$0 22        | 22            | 22             | 25            | 25              | 25            | ---           | ---  |
| Fig. 3611, Wait's - - - - -                 | ---           | 18            | 18             | 22            | 22              | 22            | 25            | ---  |

PENDULUM FOR WOOD RODS—Fig. 3608



PENDULUM FOR WIRE ROPE—Fig. 3609



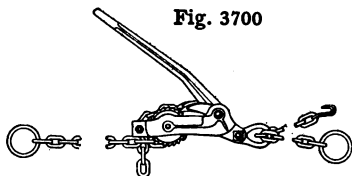
| Pendulums, figs. 3608, 3609, size | $\frac{3}{8}$ in. x 3 ft. | $\frac{1}{2}$ in. x 3½ ft. | $\frac{7}{8}$ in. x 3½ ft. | $\frac{1}{2}$ in. x 3½ ft. | $\frac{9}{16}$ in. x 3½ ft. |
|-----------------------------------|---------------------------|----------------------------|----------------------------|----------------------------|-----------------------------|
| Price - - - - -                   | \$0 25                    | 30                         | 40                         | 50                         | 60                          |

# **SURFACE EQUIPMENT FOR PUMPING WELLS**

## **LARGE STRETCHER JACK**

USED FOR ADJUSTING AND TIGHTENING LINES OF PULL RODS

**Fig. 3700**



**Weight, 63 lbs.**

|                  |           |        |
|------------------|-----------|--------|
| Complete         | - - - - - | \$7 00 |
| Jack only        | - - - - - | 3 00   |
| Long chain only  | - - - - - | 2 50   |
| Short chain only | - - - - - | 1 50   |

## **PARTS**

|                 |                |        |
|-----------------|----------------|--------|
| Wheel           | - - - - -      | \$0 75 |
| Sides (2)       | - - - - - each | 55     |
| Dogs (2)        | - - - - - each | 25     |
| Lever, complete | - - - - -      | 70     |
| Chain lifter    | - - - - -      | 15     |

## **MICHIGAN PUMPING OUTFIT**



**ADJUSTER**  
**Fig. 3301**

**ADJUSTER BOX**

**Fig. 3302**



**VALVE ROD**

**Fig. 3305**



**CONNECTING**

**JOINT**

**Fig. 3303**

**SUBSTITUTE**

**Fig. 3306**



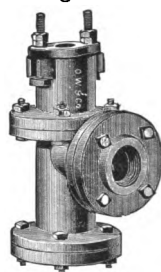
**POLISHED**

**ROD**

**Fig. 3304**

**STUFFING BOX**

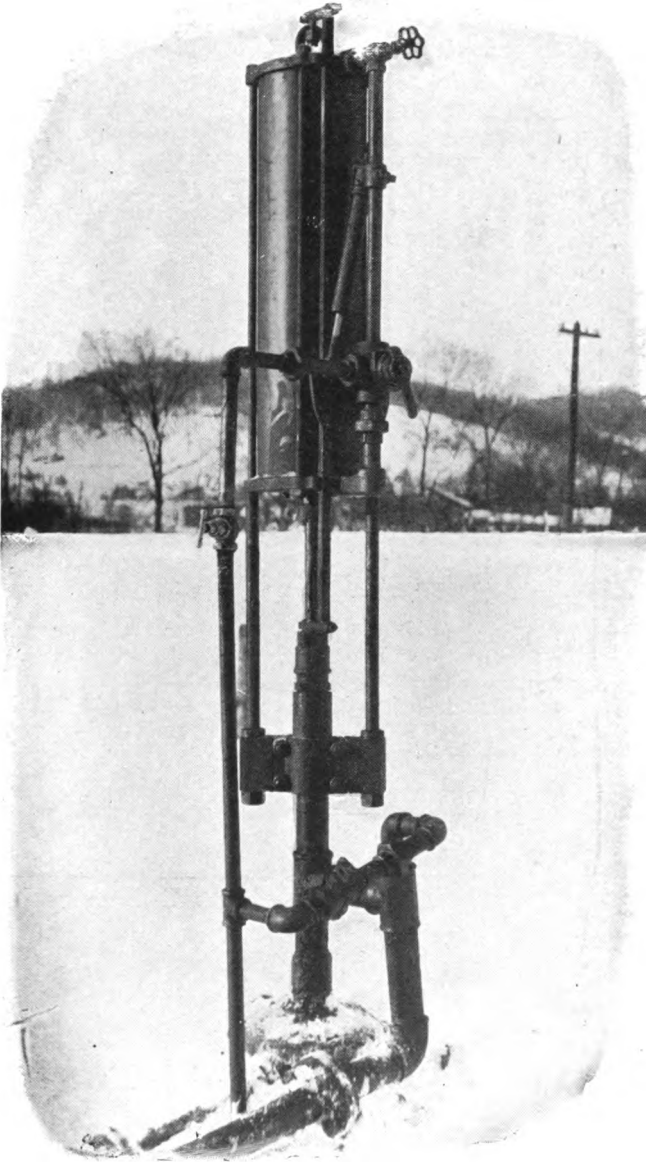
**Fig. 3307**



| <b>PARTS</b>            |           |           |           |             | <b>Figure No.</b> | <b>Weight, lbs.</b> | <b>Price</b> |
|-------------------------|-----------|-----------|-----------|-------------|-------------------|---------------------|--------------|
| Adjuster                | - - - - - | - - - - - | - - - - - | - - - - -   | 3301              | 130                 | \$46 00      |
| Connecting joint        | - - - - - | - - - - - | - - - - - | - - - - -   | 3303              | 15                  | 26 00        |
| Polished rod            | - - - - - | - - - - - | - - - - - | - - - - -   | 3304              | 170                 | 16 50        |
| Adjuster boxes          | - - - - - | - - - - - | - - - - - | per set     | 3302              | 60                  | 9 00         |
| Stuffing box            | - - - - - | - - - - - | - - - - - | - - - - -   | 3307              | 218                 | 19 50        |
| Substitute              | - - - - - | - - - - - | - - - - - | - - - - -   | 3306              | 18                  | 4 00         |
| Valve rod               | - - - - - | - - - - - | - - - - - | - - - - -   | 3305              | 30                  | 4 75         |
| <b>Weight, complete</b> | - - - - - | - - - - - | - - - - - | <b>lbs.</b> | ----              | <b>641</b>          | -----        |

## HOFFMAN PUMPING HEAD

**FOR PUMPING WITH COMPRESSED AIR**  
Patented Oct. 25, 1904. Other patents applied for  
**Fig. 3354**

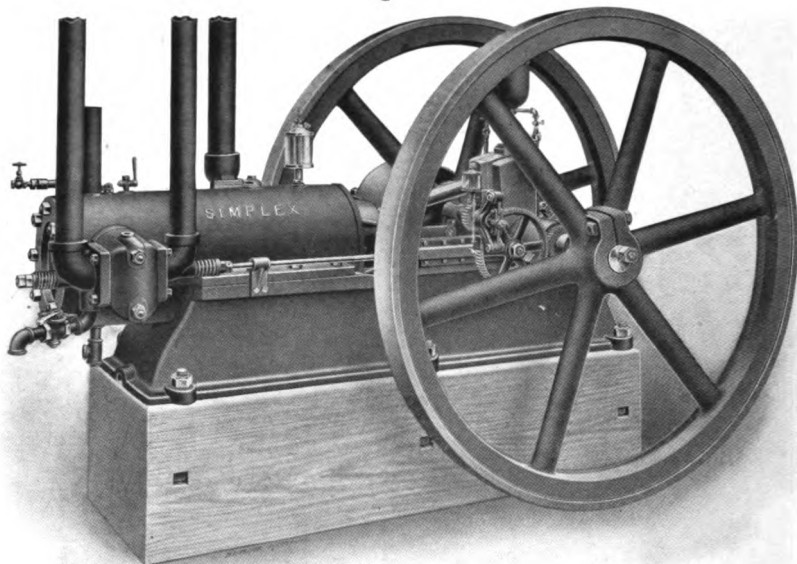
**PRICE**[illegible]

## GAS ENGINES

Gas engines are used extensively for pumping single wells or groups of wells connected to a central power.

A gas engine will do the work for which it is designed more economically and conveniently than a steam engine, but, from its different nature, cannot be overloaded to the extent that a steam engine may, which fact must be taken into account when ordering.

Fig. 1475



The Simplex Gas Engine is a four cycle engine for general power purposes.

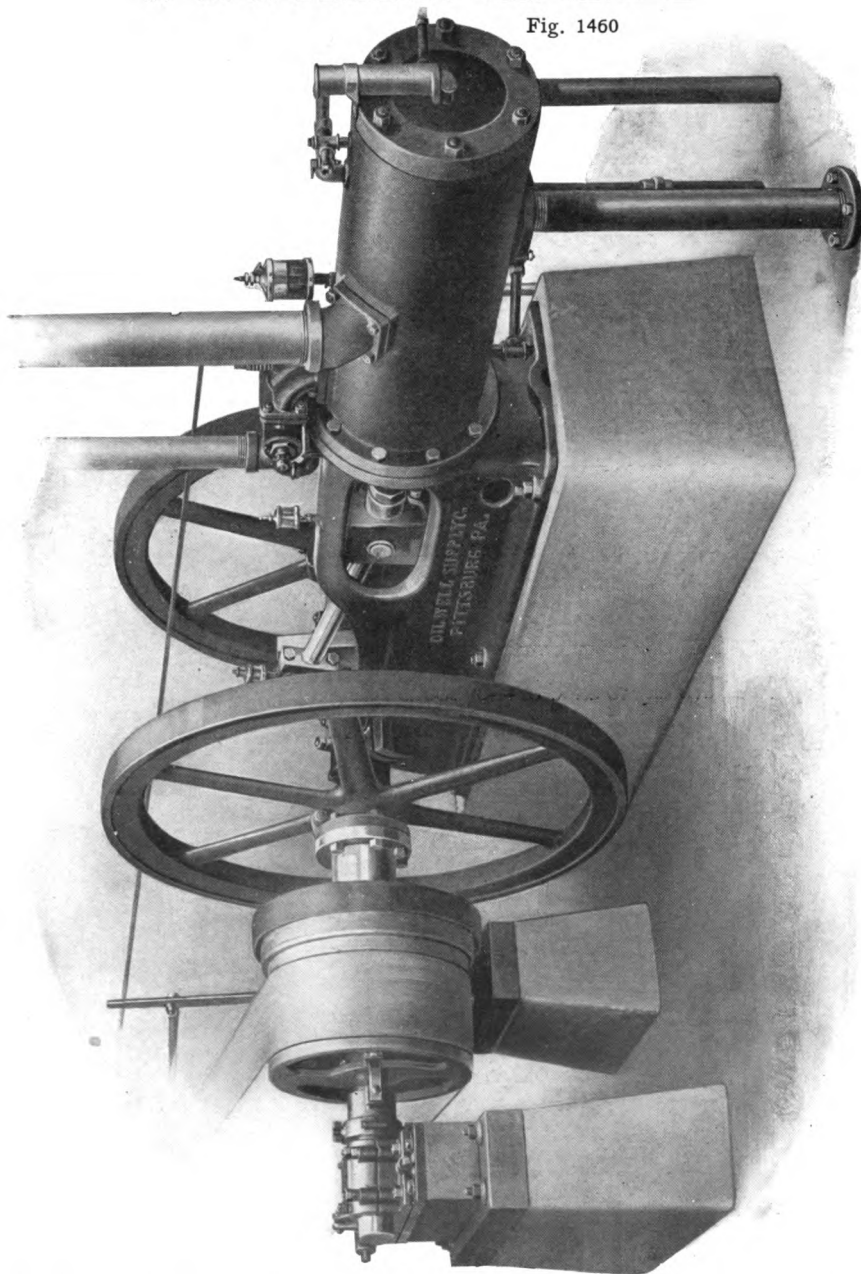
### HORSE-POWER AND DIMENSIONS

|                             |          |          |          |          |        |         |
|-----------------------------|----------|----------|----------|----------|--------|---------|
| Horse-power, rated - - -    | 10       | 15       | 20       | 25       | 35     | 50      |
| Horse-power, actual - - -   | 12       | 18       | 22½      | 27½      | 38     | 55      |
| Cylinder, diameter - inches | 8        | 10       | 10       | 12       | 13     | 14      |
| Cylinder, stroke - "        | 14       | 15       | 17       | 20       | 20     | 24      |
| Pulley, diameter - "        | 16       | 16       | 16       | 20       | 20     | 36      |
| Pulley, face - - - "        | 10       | 10       | 10       | 12       | 12     | 12      |
| Weight, complete - - lbs.   | 3,850    | 4,850    | 5,000    | 6,000    | 8,200  | 11,800  |
| Revolutions per minute - -  | 175      | 170      | 170      | 165      | 165    | 150     |
| PIPING:                     |          |          |          |          |        |         |
| Gas inlet - - - inches      | 1        | 1        | 1        | 1        | 1½     | 1½      |
| Igniter - - - - "           | ½        | ½        | ½        | ½        | ½      | ¾       |
| Water - - - - "             | 1        | 1        | 1        | 1        | 1      | 1       |
| Air - - - - - " }           | 2½       | 2½       | 2½       | 3½       | 4      | 4       |
|                             | 8 thd.   | 8 thd.   | 8 thd.   | 11½ thd. | 8 thd. | 8 thd.  |
| Exhaust, diameter " }       | 3        | 3        | 3        | 4        | 4      | 5       |
|                             | 11½ thd. | 11½ thd. | 11½ thd. | 8 thd.   | 8 thd. | 8 thd.  |
| Exhaust, length - feet }    | 5        | 5        | 5        | 5        | 5      | - - - - |
|                             | 3        | 3        | 3        | 5        | 5      | - - - - |
| Price - - - - - - -         | \$410 00 | 450 00   | 480 00   | 570 00   | 710 00 | 1100 00 |

Horse power consumption, about 12 cubic feet of natural gas per hour.

**O. W. S. DRILLING GAS ENGINE**

Fig. 1460

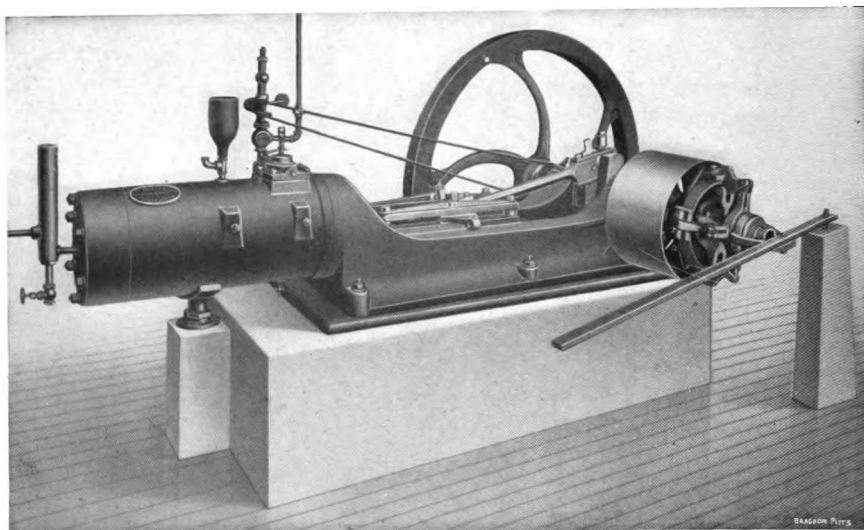


The O. W. S. Drilling Gas Engine is a two cycle crosshead type, heavy duty engine, built expressly for well drilling. 25 Horse Power. **Weight, 7,600 lbs.**  
Price, including Reversing Clutch - - - - - \$850.00



## BRADFORD GAS ENGINE

Fig. 1495



The Bradford Gas Engine is a two cycle crosshead type engine built on the standard oil country steam engine bed and combines durability with low cost.

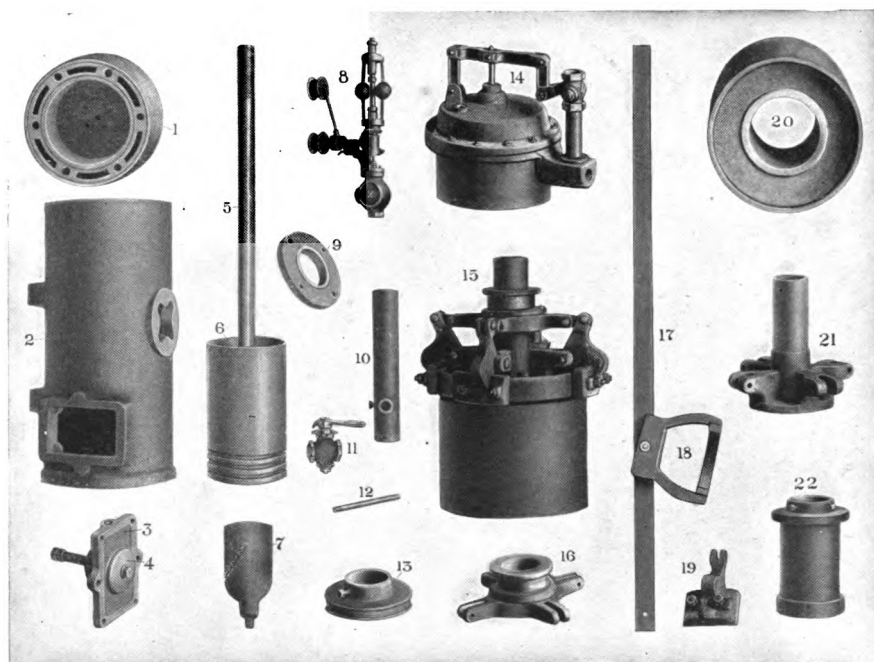
| Horse-Power | Cylinder | Weight, lbs. | Price    |
|-------------|----------|--------------|----------|
| 10          | 7½ x 12" | 3200         | \$345 00 |
| 15          | 9 x 12"  | 4000         | 375 00   |

Extra when two fly wheels are furnished - - - - - \$30 00

## CONVERTED ENGINE

To convert a steam engine to a gas engine, the steam cylinder is replaced by a gas cylinder and a clutch pulley takes the place of the regular belt pulley.

PARTS. Fig. 1496



### CYLINDER AND PARTS COMPLETE

|                          |           |                |
|--------------------------|-----------|----------------|
| 7½ x 12", 10 Horse-power | - - - - - | Price \$185 00 |
| 9 x 12", 15              | - - - - - | " 195 00       |

## HARD VULCANIZED FIBER

### RED

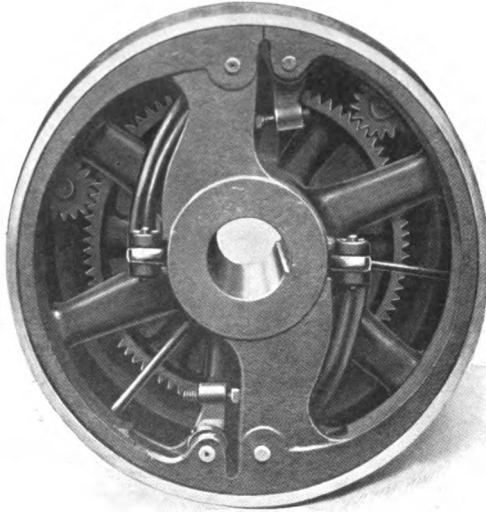
For lining up engine slides, friction pulleys, friction washers, etc.

In sheets 42 x 70 inches.

|                    |                      |                    |                        |
|--------------------|----------------------|--------------------|------------------------|
| Under ⅓-inch thick | - - per pound \$0 70 | From ½ to 1-inch   | - - - per pound \$0 60 |
| From ⅓ to ⅕-inch   | - - " 60             | 1 inch and thicker | - - " 65               |
| From ⅕ to ¼-inch   | - - " 50             |                    |                        |

## REVERSING CLUTCH

Fig. 1467



The Reversing Clutch is built to suit any of our Gas Engines and enables the operator to reverse the motion of the belt at will. It is generally used for drilling or cleaning out wells.

### GASOLINE ATTACHMENTS

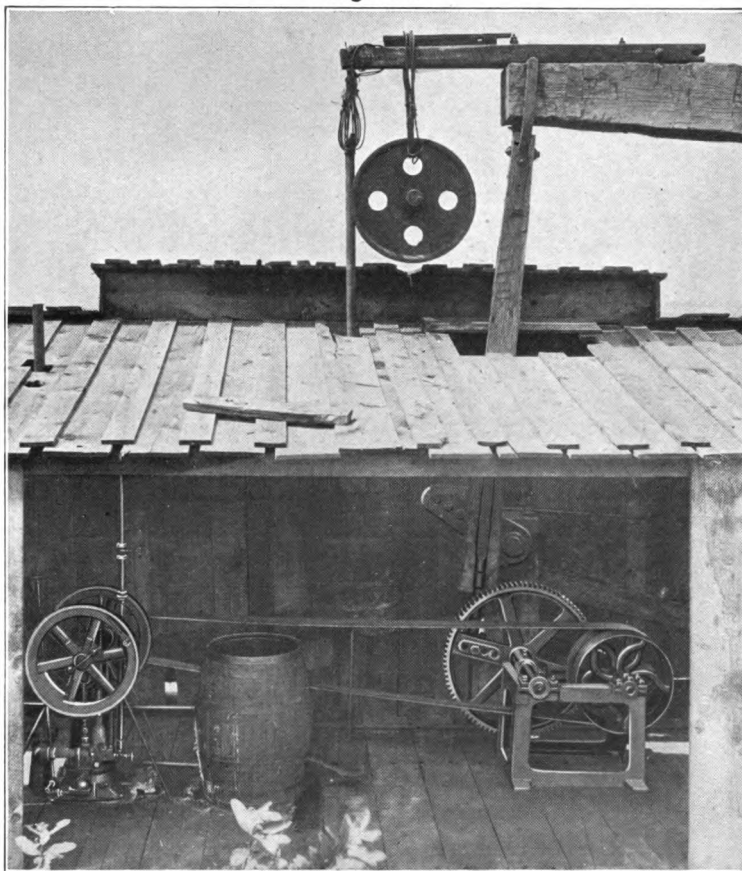
|                                                       |         |
|-------------------------------------------------------|---------|
| For 10, 15, and 20-horse-power gas engines - - - - -  | \$42 00 |
| For 25-horse-power gas engines - - - - -              | 48 00   |
| Water pumps for gas engines- - - - -                  | 15 00   |
| Electric ignition with alternating batteries- - - - - | 37 50   |

### GAS ENGINE TUBES

| Size - - inches    | $\frac{1}{4}$ x 5 | $\frac{1}{4}$ x 6 | $\frac{1}{4}$ x 7 | $\frac{1}{4}$ x 8 | $\frac{1}{4}$ x 9 | $\frac{3}{8}$ x 5 | $\frac{3}{8}$ x 6 | $\frac{3}{8}$ x 7 | $\frac{3}{8}$ x 8 | $\frac{3}{8}$ x 9 |
|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Composition - each | \$1 65            | 1 80              | 2 00              | 2 20              | 2 50              | 2 00              | 2 20              | 2 40              | 2 70              | 3 00              |
| Welded - - "       | 25                | 30                | 33                | 35                | 40                | 25                | 30                | 33                | 35                | 40                |
| Common - - "       | 14                | 20                | 24                | 28                | 30                | 14                | 20                | 24                | 28                | 30                |

## CROCKER PUMPING POWER OUTFIT

Fig. 3351



The Crocker pumping power is designed to meet the demand for small or individual plants for pumping single wells. This is much more economical than an isolated steam plant, and the comparatively small expense of installation and operation frequently renders it more desirable than a long connection to a central power plant. The attachment may be made as shown in the illustration, or the gas engine may be directly belted to the main band wheel of the rig. When this is effected, the friction of the rig iron shaft working in the wooden jack posts should be overcome by the insertion of ball bearing boxes.

The 2½-horse-power gas engine consumes about 50 cubic feet of gas per hour.

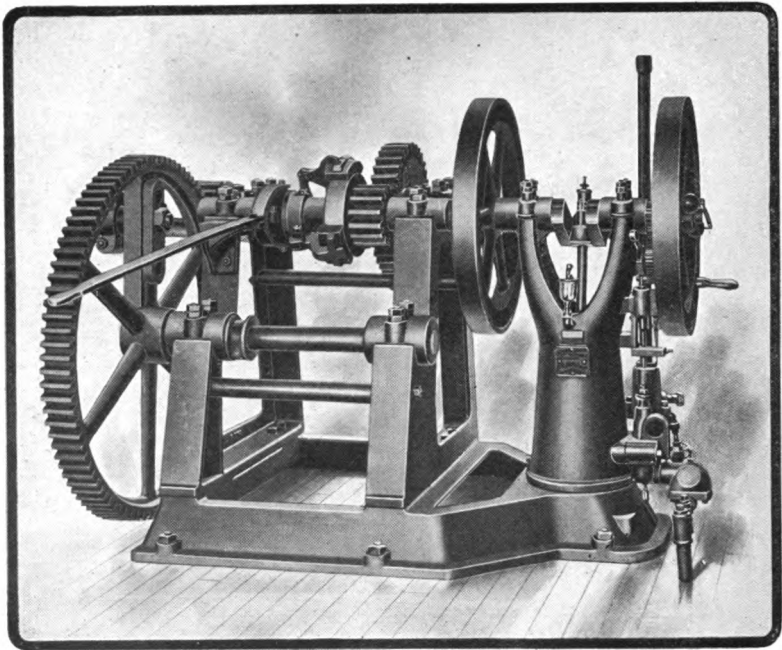
## THE OUTFIT CONSISTS OF

|                               | Weight, lbs. | Price    |
|-------------------------------|--------------|----------|
| One 2½-horse-power gas engine | 800          | \$160 00 |
| One Crocker power             |              | 77 50    |
| One belt                      | 850          | 9 00     |
| One gasometer                 |              | 5 75     |
| Fittings and bolts            |              | 1 75     |
| Total                         | 1,650        | \$254 00 |

Four-horse-power gas engine may be substituted for \$90.50 additional.

2½ H. P. DIRECT CONNECTED DOUBLE  
REDUCTION POWER

Fig. 3352



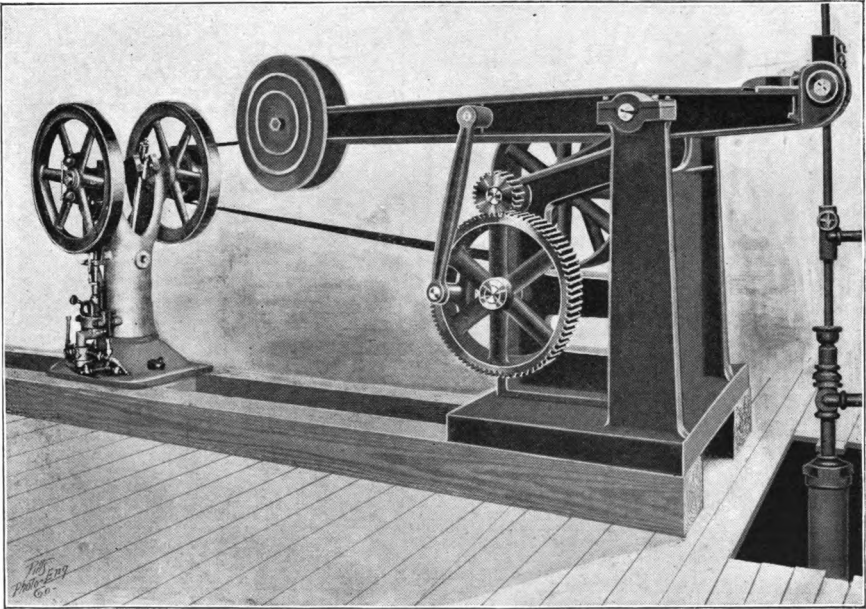
IT CONSISTS OF

the engine and power mounted on one base

|                    |   | Weight,<br>lbs. | Price    |
|--------------------|---|-----------------|----------|
| Engine             | } | 2,050           | \$274 00 |
| Power              |   |                 |          |
| Gasometer          | - | ----            | 5 75     |
| Fittings and bolts | - | ----            | 1 75     |
| Total              | - | 2,050           | \$281 50 |

## THE KLEIN GAS WELL PUMPING POWER

Fig. 3353



The outfit is designed for pumping water from gas wells from which the walking beam has been removed. It may be used in connection with an O'Dell barrel, and special  $\frac{3}{4}$  inch tubing, which acts as rods and tubing through which the water is pumped, or it can be connected to the regular rods, and fluid and gas pumped into a separator.

### CONSISTS OF

|                                         | Weight, lbs. | Price    |
|-----------------------------------------|--------------|----------|
| One 2½-horse-power gas engine - - - - - | 660          | \$160 00 |
| One Klein power - - - - -               | 1,720        | 110 00   |
| One belt - - - - -                      | ----         | 9 00     |
| One gasometer - - - - -                 | ----         | 5 75     |
| Fittings and bolts - - - - -            | ----         | 1 75     |
| Total - - - - -                         | 2,380        | \$286 50 |

Four-horse-power gas engine may be substituted for \$90.50 additional.

## LAY TONGS

Fig. 5139



Figs. 5147



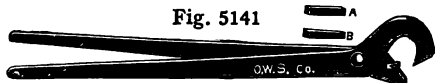
Regular

Extra heavy, long handles

| Sizes, inches  | Regular | Regular, steel lined | Ex. heavy, short handles | Ex. heavy, short handles, steel lined | Ex. heavy, long handles | Ex. heavy, long handles, steel lined | Weight, lbs. | Extra bits, dozen |
|----------------|---------|----------------------|--------------------------|---------------------------------------|-------------------------|--------------------------------------|--------------|-------------------|
| $\frac{3}{4}$  | \$3 50  | ----                 | 3 75                     | 4 50                                  | 4 00                    | ----                                 | 6 to 13      | 2 50              |
| 1              | 4 00    | ----                 | 4 50                     | 5 25                                  | 5 00                    | ----                                 | 7 to 14      |                   |
| $1\frac{1}{4}$ | 4 25    | ----                 | 4 75                     | 5 75                                  | 5 50                    | ----                                 | 14 to 24     |                   |
| $1\frac{1}{2}$ | 4 50    | ----                 | 5 00                     | 6 00                                  | 5 75                    | ----                                 | 14 to 24     |                   |
| 2              | 5 00    | 5 40                 | 5 60                     | 6 25                                  | 6 00                    | 6 75                                 | 24 to 33     |                   |
| $2\frac{1}{2}$ | 5 50    | 5 75                 | 6 00                     | 7 50                                  | 6 75                    | 8 00                                 | 26 to 35     | 3 50              |
| 3              | 6 00    | 7 50                 | 8 25                     | 9 50                                  | 8 75                    | 10 00                                | 30 to 38     |                   |
| $3\frac{1}{2}$ | 7 50    | 8 75                 | 9 00                     | 10 00                                 | 9 00                    | 11 00                                | 35 to 51     |                   |
| 4              | 9 00    | 11 00                | 9 50                     | 11 50                                 | 9 75                    | 12 00                                | 51 to 57     |                   |
| $4\frac{1}{2}$ | 10 00   | 12 00                | 13 00                    | 14 50                                 | 14 00                   | 15 00                                | 55 to 74     |                   |
| 5              | 10 50   | 12 00                | 13 00                    | 15 00                                 | 14 00                   | 15 00                                | 55 to 75     | 5 00              |
| $5\frac{1}{4}$ | 11 00   | 13 00                | 14 00                    | 15 50                                 | 15 00                   | 16 00                                | 55 to 76     |                   |
| $5\frac{1}{2}$ | 12 00   | 13 75                | 15 00                    | 16 00                                 | 16 00                   | 17 00                                | 57 to 76     |                   |
| 6              | 13 00   | 14 50                | 15 00                    | 16 00                                 | 16 00                   | 17 00                                | 77 to 94     |                   |
| $6\frac{1}{2}$ | 16 00   | 17 00                | 18 00                    | 19 00                                 | 19 00                   | 20 00                                | 78 to 94     |                   |
| 7              | 22 00   | 23 00                | 25 00                    | 26 00                                 | 26 00                   | 27 00                                | 115 to 130   | 5 00              |
| $7\frac{1}{2}$ | 25 00   | 27 50                | 27 50                    | 31 00                                 | 29 00                   | 31 00                                | --- to ---   |                   |
| 8              | 25 00   | 27 50                | 27 50                    | 31 00                                 | 29 00                   | 31 00                                | 119 to 134   |                   |
| 10             | 27 50   | 30 00                | 31 50                    | 35 00                                 | 33 00                   | 35 00                                | 145 to 164   |                   |
| 12             | 32 00   | 37 00                | 36 00                    | 42 00                                 | 40 00                   | 42 00                                | 175 to 212   |                   |

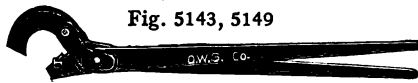
## KLEIN REGULAR

Fig. 5141



## KLEIN UNITED PATTERN

Fig. 5143, 5149



| Sizes, inches  | Regular | Regul'r, steel lined | Extra heavy, long handles | Extra heavy, long handles, steel lined | United pattern | United pattern, steel lined | United pattern, extra heavy, long handles | United pattern, ex. heavy, long handles, steel lined | United pattern, ex. heavy, short handles, steel lined | Weight, lbs. |
|----------------|---------|----------------------|---------------------------|----------------------------------------|----------------|-----------------------------|-------------------------------------------|------------------------------------------------------|-------------------------------------------------------|--------------|
| $\frac{3}{4}$  | \$4 00  | ----                 | 5 00                      | ----                                   | ----           | ----                        | ----                                      | ----                                                 | ----                                                  | 10 to 13     |
| 1              | 4 50    | ----                 | 5 50                      | ----                                   | ----           | ----                        | ----                                      | ----                                                 | ----                                                  | 10 to 24     |
| $1\frac{1}{4}$ | 5 00    | ----                 | 6 00                      | ----                                   | ----           | ----                        | ----                                      | ----                                                 | ----                                                  | 12 to 24     |
| $1\frac{1}{2}$ | 5 25    | ----                 | 6 50                      | ----                                   | ----           | ----                        | ----                                      | ----                                                 | ----                                                  | 24 to 28     |
| 2              | 5 50    | 6 00                 | 7 00                      | 7 25                                   | 6 50           | 6 50                        | 8 00                                      | 8 25                                                 | 8 00                                                  | 24 to 34     |
| $2\frac{1}{2}$ | 6 00    | 6 75                 | 7 75                      | 9 00                                   | 7 00           | 7 50                        | 9 00                                      | 9 75                                                 | 9 50                                                  | 25 to 35     |
| 3              | 6 75    | 8 00                 | 9 50                      | 11 50                                  | 7 50           | 8 75                        | 11 00                                     | 12 50                                                | 12 00                                                 | 30 to 48     |
| $3\frac{1}{2}$ | 8 00    | ----                 | 11 00                     | 13 00                                  | 9 00           | ----                        | ----                                      | 14 00                                                | ----                                                  | 30 to 49     |
| 4              | 9 50    | 11 50                | 12 50                     | 14 00                                  | 10 50          | 12 50                       | 13 50                                     | 15 00                                                | 14 50                                                 | 51 to 55     |
| $4\frac{1}{2}$ | 10 50   | ----                 | 14 00                     | 15 00                                  | ----           | ----                        | ----                                      | ----                                                 | ----                                                  | 55 to 74     |
| 5              | 11 00   | 12 50                | 14 50                     | 16 00                                  | 12 00          | 14 00                       | 15 50                                     | ----                                                 | 17 00                                                 | 55 to 75     |
| $5\frac{1}{4}$ | 12 00   | ----                 | 15 00                     | 17 00                                  | ----           | ----                        | ----                                      | ----                                                 | ----                                                  | 55 to 76     |
| $5\frac{1}{2}$ | 13 00   | 14 50                | 16 00                     | 18 00                                  | 14 00          | 15 50                       | ----                                      | ----                                                 | ----                                                  | 57 to 76     |
| 6              | 14 00   | 15 50                | 16 00                     | 19 00                                  | 15 00          | 16 50                       | 18 00                                     | 20 00                                                | 19 50                                                 | 77 to 94     |
| $6\frac{1}{2}$ | 17 00   | ----                 | ----                      | ----                                   | ----           | ----                        | ----                                      | ----                                                 | ----                                                  | 78 to ---    |
| 7              | 23 00   | ----                 | ----                      | ----                                   | ----           | ----                        | ----                                      | ----                                                 | ----                                                  | 115 to ---   |
| 8              | 26 00   | 29 00                | 29 00                     | 32 50                                  | 27 50          | 30 00                       | 31 00                                     | 34 00                                                | 33 00                                                 | 119 to 134   |
| 10             | 28 50   | 31 00                | 32 00                     | 35 00                                  | 30 00          | 33 00                       | 34 00                                     | 37 00                                                | 36 00                                                 | 145 to 164   |
| 12             | 33 00   | 36 00                | 37 00                     | 42 00                                  | 34 00          | 37 00                       | 40 00                                     | 45 00                                                | 44 00                                                 | 175 to 212   |

Bits  $\frac{3}{4}$ " to 6" inclusive, per doz. - - \$2 00 -  $6\frac{1}{2}$ " to 12", per doz. - - - - \$ 2 50  
 Wedges  $\frac{3}{4}$ " to 6" inclusive, per doz. - - 3 25 -  $6\frac{1}{2}$ " to 12", per doz. - - - - 4 00

## CRUMBIE TONGS

Fig. 5123



Wrought iron handle

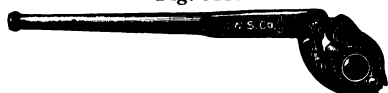
Fig. 5124



With mall. iron handle

| Sizes - - - - -                | inches | $\frac{3}{4}$ | 1    | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2    | 2 $\frac{1}{2}$ | 3    | 3 $\frac{1}{2}$ |
|--------------------------------|--------|---------------|------|-----------------|-----------------|------|-----------------|------|-----------------|
| Weight - - - - -               | lbs.   | 3             | 4    | 6               | 7               | 14   | 17              | 32   | 37              |
| Tongs - - - - -                | each   | \$2 25        | 2 50 | 3 25            | 3 50            | 4 50 | 5 00            | 8 25 | 9 00            |
| Short jaws - - - - -           | each   | 75            | 75   | 90              | 1 00            | 1 25 | 1 25            | 2 00 | 2 75            |
| Long jaws - - - - -            | each   | 1 00          | 1 00 | 1 10            | 1 25            | 1 50 | 1 50            | 2 50 | 3 25            |
| Handles - - - - -              | each   | 1 00          | 1 00 | 1 25            | 1 50            | 1 75 | 1 75            | 2 75 | 3 00            |
| Bits - - - - -                 | each   | 35            | 35   | 35              | 38              | 41   | 41              | 55   | 55              |
| Sets screws - - - - -          | each   | 06            | 06   | 06              | 06              | 06   | 06              | 06   | 06              |
| Set screw and spring - - - - - | each   | ---           | ---  | ---             | ---             | 25   | 25              | ---  | ---             |

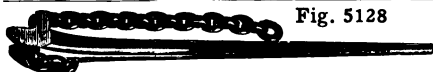
Fig. 5125



## JUMBO TONGS AND PARTS

| Sizes - - - - -               | inches | $\frac{3}{4}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1    | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 2    | 2 $\frac{1}{2}$ | 3    | 3 $\frac{1}{2}$ |
|-------------------------------|--------|---------------|---------------|---------------|------|-----------------|-----------------|------|-----------------|------|-----------------|
| Weight - - - - -              | lbs.   | 2.5           | 3             | 4             | 6    | 8               | 10              | 14   | 15              | --   | --              |
| Tongs, regular - - - - -      | each   | \$1 30        | 1 50          | 1 80          | 2 00 | 2 20            | 2 50            | 3 00 | 3 50            | 4 20 | 5 00            |
| Handles, regular - - - - -    | each   | 50            | 50            | 60            | 60   | 70              | 70              | 1 50 | 1 50            | 2 20 | 2 20            |
| Long jaws, regular - - - - -  | each   | 40            | 40            | 50            | 70   | 80              | 90              | 1 10 | 1 10            | 1 50 | 1 50            |
| Short jaws, regular - - - - - | each   | 40            | 40            | 50            | 70   | 80              | 90              | 1 00 | 1 00            | 1 30 | 1 30            |
| Tongs, heavy - - - - -        | each   | ---           | ---           | ---           | ---  | ---             | ---             | 3 50 | 4 00            | ---  | ---             |
| Handles, heavy - - - - -      | each   | ---           | ---           | ---           | ---  | ---             | ---             | 1 75 | 1 75            | ---  | ---             |
| Long jaws, heavy - - - - -    | each   | ---           | ---           | ---           | ---  | ---             | ---             | 1 20 | 1 20            | ---  | ---             |
| Short jaws, heavy - - - - -   | each   | ---           | ---           | ---           | ---  | ---             | ---             | 1 10 | 1 10            | ---  | ---             |
| Dies - - - - -                | each   | 16            | 16            | 16            | 16   | 24              | 24              | 32   | 32              | 32   | 32              |
| Springs - - - - -             | each   | 06            | 06            | 06            | 06   | 06              | 06              | 06   | 06              | 06   | 06              |
| Triggers - - - - -            | each   | 06            | 06            | 06            | 06   | 06              | 06              | 06   | 06              | 06   | 06              |
| Rivets - - - - -              | each   | 12            | 12            | 12            | 12   | 12              | 12              | 12   | 12              | 12   | 12              |

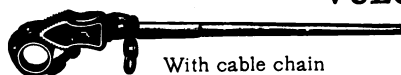
Fig. 5128



## ROBBINS PATENT CHAIN TONGS

| No. | Length of lever, inches | Size of lever near claw, inches | Size of chain, inches | Weight, lbs. | Size of pipe adapted to, inches | Price  |
|-----|-------------------------|---------------------------------|-----------------------|--------------|---------------------------------|--------|
| 2   | 25                      | 1 $\frac{1}{4}$                 | $\frac{5}{8}$         | 8            | 1 to 2                          | \$5 50 |
| 3   | 33                      | 1 $\frac{3}{8}$                 | $\frac{3}{4}$         | 13           | 1 $\frac{1}{4}$ to 4            | 6 25   |
| 4   | 44                      | 1 $\frac{1}{2}$                 | $\frac{7}{8}$         | 20           | 2 to 6                          | 9 00   |
| 5   | 56                      | 1 $\frac{3}{4}$                 | $\frac{1}{2}$         | 37           | 2 $\frac{1}{2}$ to 8            | 12 50  |
| 6   | 72                      | 2                               | $\frac{5}{8}$         | 58           | 4 to 10                         | 16 00  |
| 7   | 80                      | 2 $\frac{1}{4}$                 | $\frac{3}{4}$         | 110          | 4 to 16                         | 30 00  |
| 8   | 90                      | 2 $\frac{3}{4}$                 | $\frac{7}{8}$         | 172          | 4 to 16                         | 50 00  |

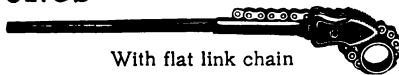
Fig. 5130



With cable chain

## VULCAN TONGS

Fig. 5131



With flat link chain

| Sizes - - - - -                | No.    | 10                             | 11                               | 12                               | 13                 | 13 $\frac{1}{2}$ | 14                   | 15               | 16      |
|--------------------------------|--------|--------------------------------|----------------------------------|----------------------------------|--------------------|------------------|----------------------|------------------|---------|
| Capacity, size pipe - - - - -  | inches | $\frac{1}{8}$ to $\frac{3}{4}$ | $\frac{1}{8}$ to 1 $\frac{1}{2}$ | $\frac{1}{4}$ to 2 $\frac{1}{2}$ | $\frac{3}{4}$ to 4 | 1 to 6           | 1 $\frac{1}{2}$ to 8 | 2 to 12          | 4 to 18 |
| Length over all - - - - -      | inches | 13 $\frac{3}{4}$               | 20                               | 27                               | 37                 | 44 $\frac{1}{2}$ | 50 $\frac{1}{2}$     | 64 $\frac{1}{2}$ | 87      |
| Weight - - - - -               | lbs.   | 1 $\frac{1}{2}$                | 4 $\frac{3}{4}$                  | 8 $\frac{3}{4}$                  | 16                 | 21               | 29                   | 49               | 137     |
| With cable chain - - - - -     |        | \$2 25                         | 3 25                             | 4 50                             | 6 25               | 7 75             | 9 50                 | 16 00            | 40 00   |
| With flat link chain - - - - - |        | 2 50                           | 3 50                             | 5 00                             | 7 00               | 9 00             | 11 00                | 18 00            | 40 00   |

For Vulcan Tong parts see next page.



VULCAN TONG PARTS

| Sizes - - - - - No.          | 10     | 11     | 12     | 13     | 13½    | 14     | 15     | 16      |
|------------------------------|--------|--------|--------|--------|--------|--------|--------|---------|
| Extra Cable Chain - - - each | \$0 50 | \$0 75 | \$1 00 | \$1 75 | \$2 00 | \$2 50 | \$4 00 | \$13 00 |
| “ Flat Link Chain - - “      | 75     | 1 00   | 1 50   | 2 50   | 3 25   | 4 00   | 6 00   | 13 00   |
| “ Handle - - - - - “         | 75     | 1 00   | 1 50   | 2 25   | 3 00   | 4 00   | 6 00   | 14 00   |
| “ Jaws - - - - - per pair    | 1 00   | 1 75   | 2 75   | 4 00   | 4 75   | 5 50   | 7 50   | 16 00   |
| “ Jaw Bolt - - - - - each    | 10     | 10     | 10     | 12     | 15     | 15     | 25     | 50      |
| “ Pin - - - - - “            | 02     | 02     | 02     | 03     | 03     | 03     | 05     | 05      |

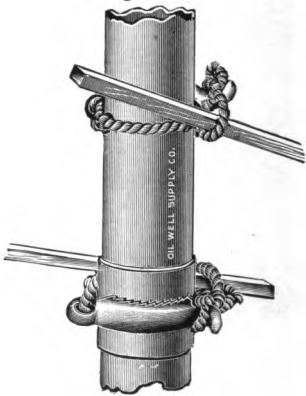
CASING TONGS OR PIPE GRIPS

FOR TURNING CASING

Fig. 5155



Fig. 5156



| Number - - - - -             | 1       | 2        |
|------------------------------|---------|----------|
| Size casing for - - - inches | 4 to 6½ | 6½ to 13 |
| Each - - - - -               | \$2 75  | \$3 25   |

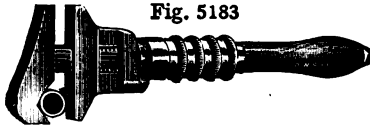


Fig. 5183

## PIPE WRENCH

## BRIGGS COMBINATION

| Sizes - - - - -     | inches | 8       | 10    | 12    | 15    | 18    |
|---------------------|--------|---------|-------|-------|-------|-------|
| Weight - - - - -    | lbs.   | 1.4     | 2     | 3.1   | 4.4   | 7.5   |
| Per dozen - - - - - |        | \$23 00 | 25 25 | 28 50 | 40 50 | 72 00 |

## PARTS OF BRIGGS COMBINATION WRENCH

| Size - - - - -              | inches | 8      | 10 | 12 | 15 | 18   |
|-----------------------------|--------|--------|----|----|----|------|
| Slides only - - - - -       | each   | \$0 40 | 50 | 60 | 80 | 1 20 |
| Steel dogs - - - - -        | each   | 16     | 20 | 24 | 30 | 40   |
| Sleeves - - - - -           | each   | 24     | 30 | 40 | 50 | 70   |
| Tips and ferrules - - - - - | each   | 04     | 04 | 04 | 06 | 08   |
| Handles - - - - -           | each   | 12     | 12 | 14 | 16 | 20   |
| Nuts - - - - -              | each   | 16     | 20 | 24 | 30 | 40   |

Fig. 5102



## SAUNDERS PIPE CUTTER

| Number - - - - -          |        | 1                  | 2      | 3      | 4                   |
|---------------------------|--------|--------------------|--------|--------|---------------------|
| Cuts pipe from - - - - -  | inches | $\frac{1}{8}$ to 1 | 1 to 2 | 2 to 3 | $2\frac{1}{2}$ to 4 |
| Weight - - - - -          | lbs.   | 3.2                | 6.4    | 12     | 15                  |
| Complete - - - - -        | each   | \$3 00             | 4 50   | 11 00  | 18 00               |
| Block and wheel - - - - - | each   | 1 25               | 1 75   | 2 75   | 3 50                |
| Cutter wheels - - - - -   | each   | 24                 | 32     | 60     | 60                  |
| Rollers - - - - -         | each   | 24                 | 32     | 50     | 50                  |
| Pins - - - - -            | each   | 10                 | 10     | 15     | 15                  |

Fig. 5098

BARNES THREE WHEEL  
PIPE CUTTER

Fig. 5099



| Number - - - - -    |           | 1                  | 2                  | 3                   | 4                   | 5      | 6      | 7       |
|---------------------|-----------|--------------------|--------------------|---------------------|---------------------|--------|--------|---------|
| Cuts from - - - - - | inches    | $\frac{1}{8}$ to 1 | $\frac{1}{2}$ to 2 | $1\frac{1}{2}$ to 3 | $2\frac{1}{2}$ to 4 | 4 to 6 | 6 to 8 | 9 to 12 |
| Weight - - - - -    | lbs.      | 3                  | 5                  | 13                  | 15                  | 24     | 30     | 35      |
| Price - - - - -     |           | \$4 50             | 6 00               | 10 00               | 20 00               | 30 00  | 40 00  | 50 00   |
| Wheels - - - - -    | each      | 25                 | 30                 | 40                  | 50                  | 75     | 75     | 75      |
| Pins - - - - -      | per dozen | 1 00               | 1 00               | 1 00                | 2 00                | 2 00   | 2 00   | 2 00    |

Fig. 5095



## STANWOOD PIPE CUTTER



Fig. 5096

| Number - - - - -                   |        | 1                  | 2                  | 3      |
|------------------------------------|--------|--------------------|--------------------|--------|
| Cuts pipe from - - - - -           | inches | $\frac{1}{8}$ to 1 | $\frac{3}{4}$ to 2 | 2 to 3 |
| Weight - - - - -                   | lbs.   | 3.2                | 8                  | 22     |
| Fig. 5095 - - - - -                | each   | \$1 50             | 2 25               | 7 00   |
| Cutter wheels, fig. 5096 - - - - - | each   | 12                 | 18                 | 25     |
| Cutter blocks and wheels - - - - - | each   | 45                 | 60                 | 1 25   |
| Pins - - - - -                     | each   | 05                 | 05                 | 08     |

SOLID STOCK AND DIES

No. A

Fig. 5061



With single row of dies

Threads  $\frac{1}{8}$  to  $\frac{1}{2}$  inch pipe, fig. 5061 - - - - - \$7 00  
Extra die plates - - - - - each, 5 00

Weight, 7 lbs.

No. AA

Fig. 5063



With double row of dies

Threads  $\frac{1}{8}$  to 1 inch pipe, fig. 5063 - - - - - \$10 00  
Extra die plates, cutting  $\frac{1}{8}$ ,  $\frac{1}{4}$  and  $\frac{3}{8}$  - - - - - each, 3 50  
Extra die plates, cutting  $\frac{1}{2}$ ,  $\frac{3}{4}$  and 1 - - - - - each, 4 00

Weight, 12 lbs.

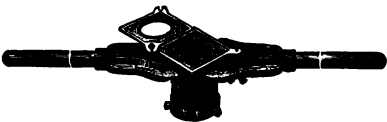
MALLEABLE STOCK WITH SOLID DIES

Nos. 0, 1 and  $1\frac{1}{2}$   
Fig. 5065



Without leader screw

No. 2  
Fig. 5067



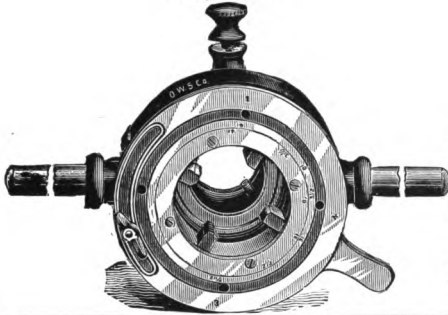
With leader screw

| Numbers - - - - -                        | 0                                                             | 1                                                                 | $1\frac{1}{2}$                    | $1\frac{1}{2}$                     | <sup>2</sup><br>With leader<br>screw |
|------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| Pipe sizes of dies - - - - - inches      | $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ | $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , 1 | $\frac{3}{4}$ , 1, $1\frac{1}{4}$ | 1, $1\frac{1}{4}$ , $1\frac{1}{2}$ | $1\frac{1}{4}$ , $1\frac{1}{2}$ , 2  |
| Dimensions of dies - - - - - inches      | $2 \times \frac{1}{2}$                                        | $2\frac{1}{2} \times \frac{3}{4}$                                 | $3 \times \frac{3}{4}$            | $3 \times \frac{3}{4}$             | $4 \times \frac{7}{8}$               |
| Weight, complete - - - - - lbs.          | 7                                                             | 14                                                                | 9                                 | -----                              | 24                                   |
| Stock, complete, with r. h. dies - - -   | \$9 50                                                        | 15 00                                                             | 13 50                             | 13 50                              | 20 00                                |
| Stocks only - - - - - each               | 3 50                                                          | 5 00                                                              | 6 00                              | 6 00                               | 9 50                                 |
| Extra dies, right or left - - - - - each | 1 50                                                          | 2 00                                                              | 2 50                              | 2 50                               | 3 50                                 |
| Extra guides - - - - - each              | 25                                                            | 35                                                                | 45                                | 45                                 | 60                                   |
| Die frames - - - - - each                | ----                                                          | 30                                                                | 40                                | 40                                 | 50                                   |

Dies for threading  $1\frac{1}{4}$ -inch pipe with English threads can also be furnished.

## STOCKS AND DIES

Fig. 5073

WITH RATCHET ATTACHMENT  
AND ADJUSTABLE DIES

With leader screw

| Numbers                                                  | 2       | 3½     |
|----------------------------------------------------------|---------|--------|
| Threads pipe, sizes - - inches                           | 2½ to 4 | 5 to 6 |
| Weight - - - - - lbs.                                    | 100     | -----  |
| Complete - - - - -                                       | \$50 00 | 100 00 |
| Extra dies, per set of four, cutting two sizes - - - - - | 5 00    | 7 00   |

WITH FOUR ADJUSTABLE DIES  
AND LEADER SCREW

Weight, 25 lbs.

|                                                       |         |
|-------------------------------------------------------|---------|
| No. 3 threads 1, 1¼, 1½ and 2" pipe - - - - -         | \$20 00 |
| Extra dies, per set of 4, cutting two sizes - - - - - | 2 00    |

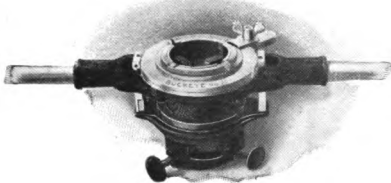
Fig. 5075



## PARTS FOR FIG. 5075

|                             |            |                                     |            |
|-----------------------------|------------|-------------------------------------|------------|
| Body - - - - -              | \$4 50     | Cast iron yoke rings - - - each,    | \$0 50     |
| Yokes - - - - -             | each, 1 25 | Pawl spring and button - - - each,  | 1 00       |
| Cam plates - - - - -        | each, 3 00 | Handles - - - - -                   | each, 1 00 |
| Leader screws - - - - -     | each, 1 00 | Face plate screws - - - - -         | each, 03   |
| Thumb screws - - - - -      | each, 40   | Leader screw set screws - - - each, | 20         |
| Small brass rings - - - - - | each, 1 00 | Bushings - - - - -                  | each, 25   |

Fig. 5090



## BEAVER DIE STOCK

Cuts 1", 1¼", 1½", 2" Pipe

|                                       |         |
|---------------------------------------|---------|
| No. 20, 1" to 2", complete - - - - -  | \$30 00 |
| No. 20, Extra Dies, per set - - - - - | 3 50    |

## WITH SECTIONAL DIES FOR LARGE PIPE

Cast iron body, brass leader screw, six dies

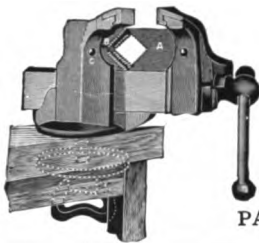
Used largely for laying pipe lines. Can be used on the ground.

Fig. 5080



|                           | With two handles    |         |           |       | With one handle |        |
|---------------------------|---------------------|---------|-----------|-------|-----------------|--------|
|                           | 4                   | 5       | Casing 5½ | 6     | 8               | 10     |
| Threading pipe - - sizes  | 55                  | 100     | -----     | 115   | 235             | 222    |
| Weight, complete - lbs.   | 40                  | 48      | -----     | 48    | 72              | 72     |
| Length of handles - - in. | Price, complete - - | \$42 00 | 70 00     | 85 00 | 100 00          | 125 00 |
| Extra dies - per set      | 6 00                | 7 00    | 9 00      | 12 00 | 13 00           | 14 00  |

Fig. 5163



SMITH COMBINATION VISE

|                               |                    |                    |                    |
|-------------------------------|--------------------|--------------------|--------------------|
| Size number - - - - -         | 1                  | 2                  | 3                  |
| Size pipe will catch - inches | $\frac{1}{8}$ to 2 | $\frac{1}{4}$ to 3 | $\frac{1}{2}$ to 4 |
| Weight - - - - - lbs.         | 47                 | 70                 | 100                |
| Price - - - - -               | \$16 00            | 20 00              | 28 00              |

PARTS OF SMITH COMBINATION VISE

|                                                   |        |      |      |
|---------------------------------------------------|--------|------|------|
| Size number for - - - - -                         | 1      | 2    | 3    |
| Back jaw, with parallel jaw - - - - -             | \$3 00 | 3 75 | 4 25 |
| Front or sliding jaw, with parallel jaw - - - - - | 3 00   | 3 75 | 4 25 |
| Long "V" pipe jaw, single - - - - -               | 75     | 1 00 | 1 25 |
| Short "V" pipe jaw, double - - - - -              | 1 25   | 1 75 | 2 25 |
| Screw nut, handle and collar - - - - -            | 1 75   | 2 00 | 2 25 |
| Nut - - - - -                                     | 25     | 35   | 45   |
| Hand nut - - - - -                                | 25     | 25   | 25   |
| Bench bolt - - - - -                              | 15     | 15   | 15   |
| Large washer, swivel - - - - -                    | 20     | 20   | 20   |
| Small washer - - - - -                            | 10     | 10   | 10   |
| Collar for screw - - - - -                        | 10     | 10   | 10   |
| Parallel jaw - - - - -                            | 50     | 50   | 50   |

O. W. S. CO. HINGE MALLEABLE PIPE VISE

Fig. 5158

Fig. 5158

| Number | Capacity                                   | Weight, lbs. | Price   |
|--------|--------------------------------------------|--------------|---------|
| 10     | $\frac{1}{8}$ to 2 $\frac{1}{2}$ inch pipe | 17           | \$10 00 |
| 9      | $\frac{1}{8}$ to 2 inch pipe               | 12           | 8 00    |



MALLEABLE IRON PIPE VISE

Fig. 5160

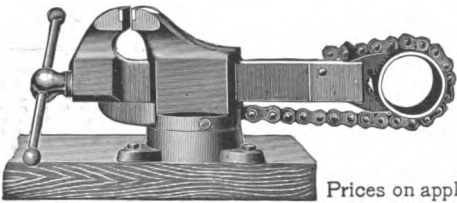
|                               |                    |                    |
|-------------------------------|--------------------|--------------------|
| Size Number - - - - -         | 1                  | 2                  |
| Size pipe will catch - inches | $\frac{1}{8}$ to 2 | $\frac{1}{8}$ to 3 |
| Weight - - - - - lbs.         | 20                 | 26                 |
| Price - - - - -               | \$10 00            | 14 00              |
| Extra jaws - - - - - per set  | 2 50               | 3 00               |



LONG'S PATENT LOCK AND SWIVEL BASE VISE

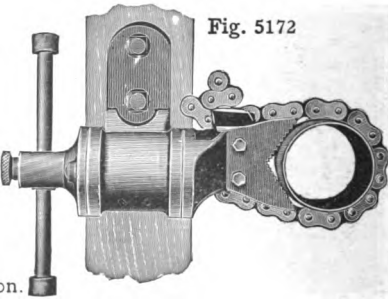
COMBINATION MACHINIST'S AND PIPE

Fig. 5171



LONG'S PATENT LOCK PIPE VISE

Fig. 5172



Prices on application.

# FORGE TOOLS, ETC.

**BLACKSMITH'S**  
Fig. 2441



Straight peen

**SLEDGES**  
Fig. 2443

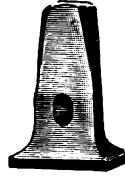


Cross peen

**HARDY**  
Fig. 2445



**FLATTER**  
Fig. 2447



**SET HAMMER**  
Fig. 2449



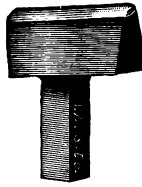
## FULLERS

Fig. 2451



Top

Fig. 2453



Bottom

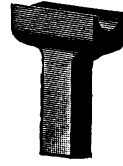
## SWEDGES

Fig. 2455



Top

Fig. 2457



Bottom

## PUNCHES

Fig. 2459



Round

Fig. 2461



Square

Fig. 2463



Hot

## CHISELS

Fig. 2465



Cold

Blacksmith sledges 3 to 5 lbs. fig. 2441 or fig. 2443, solid steel - - - - - per lb., \$0 36  
Blacksmith tools 5½ lbs. or over figs. 2445 to 2465, inclusive - - - - - per lb., 30

Fig. 2435



3-inch

## PULLEYS FOR FORGE

Clothes line pulleys

No. 65, 3-inch, fig. 2435 - - - - - per dozen, \$1 85

Weight, each, 12 ounces.

Forge, 5-inch, fig. 2437 - - - - - per dozen, 5 00

Weight, each, 3 pounds.

Forge, 5 inch, Hartz steel } - - per dozen, 6 00  
With self oiling Sheave }

Fig. 2437



5-inch

## FORGE TOOLS, ETC.

### NEW STYLE CAST IRON ANVIL

#### ANVIL

Fig. 2425



Fig. 2426



#### BALL PEEN HAMMER

Fig. 2427



### ANVILS—Fig. 2425

Eagle, weighing from 100 to 800 pounds - - - - - per pound, \$0 08½

### NEW STYLE DERRICK ANVIL, CAST IRON—Fig. 2426

Weight, 350 pounds - - - - - \$22 00

### BALL PEEN HAMMERS—Fig. 2427

| No. | Weight, lbs. | Per dozen | No. | Weight, lbs., oz. | Per dozen |
|-----|--------------|-----------|-----|-------------------|-----------|
| 70  | 3            | \$20 00   | 73  | 1½ --             | \$12 25   |
| --  | 2            | 16 50     | --  | -- --             | -----     |
| 70½ | 2½           | 17 00     | 74  | 1 --              | 11 25     |
| 71  | 1¾           | 15 00     | 75  | -- 13             | 10 50     |
| 72  | 1½           | 13 50     | 76  | -- 10             | 10 00     |



### BLACKSMITH'S TONGS

Fig. 2429

Extra heavy, weight, 4½ pounds - - - - - each, \$1 00

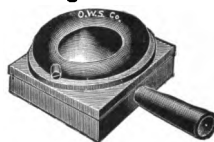
#### BELLOWS

Fig. 2431



#### TUYERE IRON FOR FORGE

Fig. 2433



### BELLOWS—Fig. 2431

| Size - - - - inches     | 30      | 32    | 34    | 36    | 38    | 40    | 42    | 44    | 46    | 48    | 50    |
|-------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Manufacturer's list - - | \$15 00 | 17 00 | 19 00 | 21 00 | 24 00 | 28 00 | 34 00 | 40 00 | 45 00 | 50 00 | 60 00 |
| Weight - - - - lbs.     | -----   | ----- | ----- | ----- | ----- | 150   | 160   | 175   | ----- | ----- | ----- |

### TUYERE IRON—Fig. 2433

Duck's Nest - - - - - \$2 00

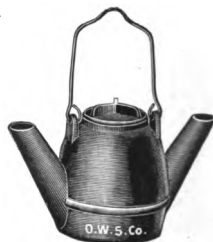
#### WATER TUYERES—WROUGHT IRON

Not illustrated

| No. | Length, inches | Price  |
|-----|----------------|--------|
| 1   | 12             | \$4 00 |
| 2   | 13½            | 4 50   |
| 3   | 15             | 5 50   |
| 4   | 16½            | 6 00   |

#### DERRICK LAMP—

Fig. 2440

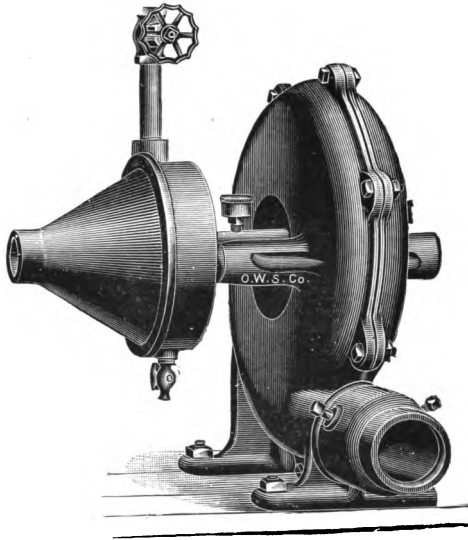


Weight, 15 lbs,  
Each - - \$1 50

## STEAM BLOWER

USED ON DRILLING RIGS IN PLACE OF BELLOWS

Fig. 2430



Weight, 73 lbs.

No. 3, 3 $\frac{1}{4}$ " air outlet, fitted for 2" pipe - - - - - 15 00

**ALL BLOWERS ARE FURNISHED SECURELY BOLTED  
ON WOOD BASE**

and fitted with nozzle for pipe,  $\frac{1}{2}$ " nipple and valve for steam connection, 2 grease cups and drain cock.

The No. 3 Blower is of suitable size for use in Standard Rig.

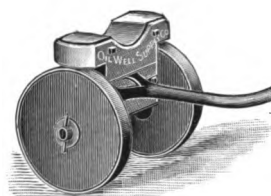
The Blowers are simple, strong and effective—no belts or pulleys are required. Operated by steam or compressed air.

Blast regulated by Globe Valve.



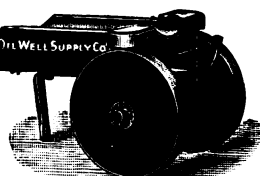
## CASING WAGONS

FRONT—Fig. 1684



Weight, 75 lbs.

REAR—Fig. 1684-A

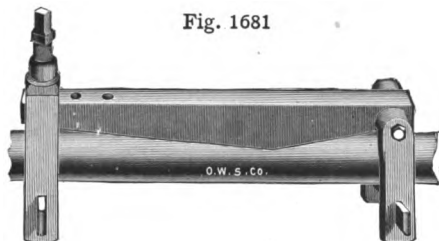


Weight, 85 lbs.

Per pair - - - - - \$20 00

## STEM STRAIGHTENER

Fig. 1681



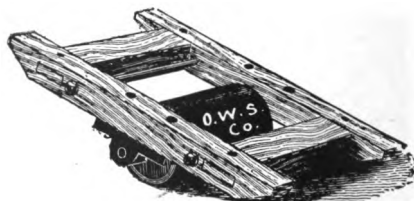
Weight, 350 lbs.

To straighten auger stems or sinker bars.  
Can be applied when lying on the ground  
or standing in the derrick.

Prices on application.

## DOLLIE

Fig. 1683.



For moving stems, pipe, etc.

| Size,<br>inches | Size roller,<br>inches | Weight,<br>lbs. | Price  |
|-----------------|------------------------|-----------------|--------|
| 15½ x 18½       | 10 x 6                 | 42              | \$6 00 |
| 19½ x 26        | 12 x 6                 | 58              | 8 00   |

## DERRICK STOVE

Fig. 2424

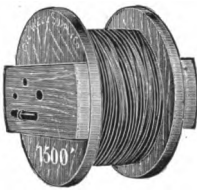


This stove was designed to meet the requirements of the derrick. The castings are heavy and constructed to withstand hard service.

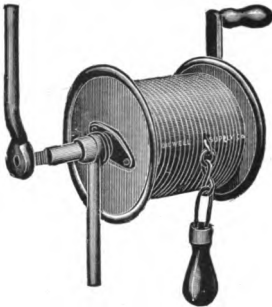
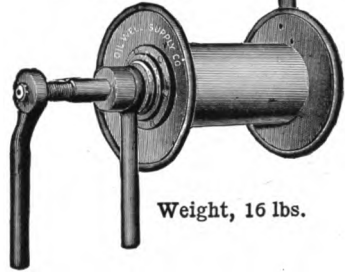
Made in four sections, easily taken apart and transported.

Weight, 340 lbs.

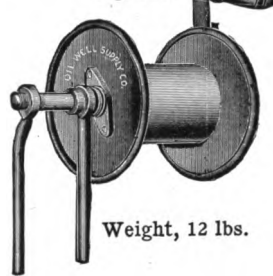
Complete - - - - - \$20 00

**MEASURING LINES AND REELS****WELL-MEASURE WIRE ONLY****Fig. 3160**

Wound on spool for shipping purposes

**McCLURE'S PATENT REEL AND WIRE COMPLETE****Fig. 3164****O. W. S. CO. REEL ONLY****Fig. 3162**

Weight, 16 lbs.

**McCLURE'S PATENT REEL ONLY****Fig. 3166**

Weight, 12 lbs.

**MEASURING LINES AND REELS****PRICES FOR LINES ONLY WITHOUT REELS**

| Length, Feet | Aluminum Wire Lines | Steel Wire Lines | Length, Feet | Aluminum Wire Lines | Steel Wire Lines | Length, Feet | Aluminum Wire Lines | Steel Wire Lines |
|--------------|---------------------|------------------|--------------|---------------------|------------------|--------------|---------------------|------------------|
| 500          | \$7 90              | \$6 40           | 1700         | \$18 85             | \$13 75          | 2900         | \$29 95             | \$21 25          |
| 600          | 8 80                | 7 00             | 1800         | 19 80               | 14 40            | 3000         | 30 90               | 21 90            |
| 700          | 9 70                | 7 60             | 1900         | 20 70               | 15 00            | 3100         | 31 80               | 22 50            |
| 800          | 10 55               | 8 15             | 2000         | 21 65               | 15 65            | 3200         | 32 75               | 23 15            |
| 900          | 11 45               | 8 75             | 2100         | 22 55               | 16 25            | 3300         | 33 65               | 23 75            |
| 1000         | 12 40               | 9 40             | 2200         | 23 50               | 16 90            | 3400         | 34 60               | 24 40            |
| 1100         | 13 30               | 10 00            | 2300         | 24 15               | 17 25            | 3500         | 35 50               | 25 00            |
| 1200         | 14 25               | 10 65            | 2400         | 25 35               | 18 15            | 3600         | 36 45               | 25 65            |
| 1300         | 15 15               | 11 25            | 2500         | 26 25               | 18 75            | 3700         | 37 35               | 26 25            |
| 1400         | 16 10               | 11 90            | 2600         | 27 20               | 19 40            | 3800         | 38 30               | 26 90            |
| 1500         | 17 00               | 12 50            | 2700         | 28 10               | 20 00            | ----         | -----               | -----            |
| 1600         | 17 95               | 13 15            | 2800         | 29 05               | 20 65            | ----         | -----               | -----            |

**Prices for Measuring Lines Complete with Reel and Weight**

Add to above list prices for McClure Reel and Weight - - - - - \$5 50

Add to above list prices for O. W. S. Co. Reel and Weight - - - - - 11 00

**MEASURING LINE REELS AND PARTS**

| <b>McCLURE</b> |   |        | <b>O. W. S. CO.</b> |   |         |
|----------------|---|--------|---------------------|---|---------|
| Complete, each | - | \$6 50 | Complete, each      | - | \$12 00 |
| Shafts, each   | - | 3 00   | Shafts, each        | - | 5 00    |
| Brakes, each   | - | 1 00   | Brakes, each        | - | 1 00    |
| Locknuts, each | - | 1 00   | Locknuts, each      | - | 1 00    |
| Handles, each  | - | 50     | Handles, each       | - | 50      |
| Cones, each    | - | 10     | Weights, each       | - | 50      |
| Weights, each  | - | 50     |                     |   |         |

## TORPEDO REELS

O. W. S. CO.—Fig. 3730

McCLURE'S PAT.—Fig. 3732

PARAFFINE  
FINE  
AUGER

Fig. 3212



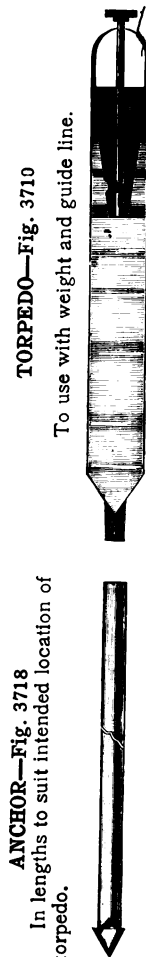
Short auger - - - - \$15 00  
 To clean paraffine out of tubing.  
 Long auger - - - - \$20 00

## ANCHOR—Fig. 3718

In lengths to suit intended location of torpedo.

## TORPEDO—Fig. 3710

To use with weight and guide line.



## TORPEDO

To use with a go-devil; is lowered with a line which is drawn out before firing.



Shells and parts to order.

## WEIGHT OR GO-DEVIL

For firing the torpedo.



Dropped in well after torpedo is in place.

Fig. 3714

## LINE SQUIB

Used for the same purpose as fig. 3716



Fig. 3722

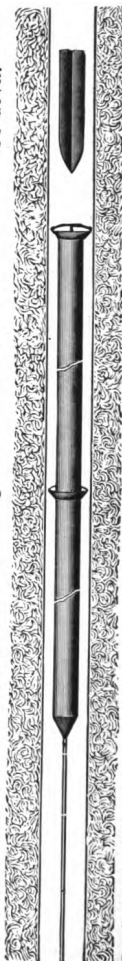
## JACK SQUIB

A small torpedo used to "set off" a large one after other means have failed.

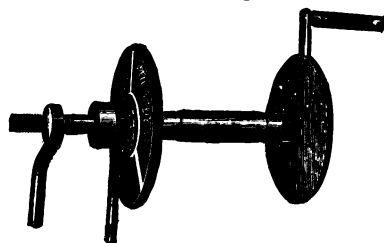


Fig. 3716

Fig. 3712—Showing position of torpedo after lowering to bottom of well.  
 Oil bearing rock or sand.  
 Anchor.

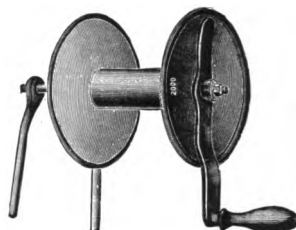


Pocket in well below oil sand, to hold detritus.



Either fig. 3730 or 3732.

Size, 12 x 13 inches - - - \$23 00  
 Size, 12 x 14 inches - - - 25 00  
 Size, 12 x 18 inches - - - 28 00



## TORPEDO LINES

Manila, 3 strand, per lb. - - \$0 25  
 Manila, 4 strand, per lb. - - 30  
 For torpedo wire, see page 332.

## WOOD DRY HOLE PLUGS

COMMON

Fig. 3176



MALE AND FEMALE

Fig. 3174

MALE AND FEMALE  
WITHOUT PLUG

Fig. 3178



MANDREL

Fig. 3170



Fig. 3180

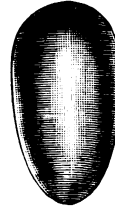


With ring

CAST IRON DRY HOLE PLUGS

| Size, inches | Weight, lbs. |
|--------------|--------------|
| 4            | 12           |
| 4½           | 13           |
| 5            | 17           |
| 5½           | 24           |
| 6            | 30           |
| 6½           | 33           |
| 7            | 47           |
| 7½           | 60           |
| 8            | 71           |
| 8½           | 77           |

Fig. 3182

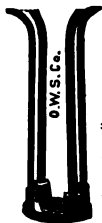


Oblong

Cast iron, all sizes, fig. 3180 or 3182 - - - per lb., \$0 05

| Size hole - - - - - inches   | 4½     | 4½   | 5    | 5½   | 5½   | 6½   | 6½   | 7½   | 8½   | 10   | 13    |
|------------------------------|--------|------|------|------|------|------|------|------|------|------|-------|
| Wood, fig. 3176 - - - - each | \$0 50 | 50   | 50   | 75   | 75   | 1 00 | 1 00 | 1 25 | 1 25 | 2 00 | 5 00  |
| Weight, fig. 3176 - - - lbs. | 4      | 4.5  | 5    | 6.5  | 8    | 10   | 12   | 14   | 24   | 30   | 40    |
| Wood, fig. 3174 - - - - each | 1 75   | 1 75 | 1 75 | 2 00 | 2 00 | 2 25 | 2 25 | 2 50 | 2 50 | 4 00 | 10 00 |
| Wood, fig. 3178 - - - - "    | 2 00   | 2 00 | 2 00 | 2 50 | 2 50 | 2 75 | 2 75 | 3 25 | 3 25 | 5 00 | 11 00 |
| Wood, fig. 3170 - - - - "    | 2 50   | 2 50 | 2 50 | 3 00 | 3 00 | 3 50 | 3 50 | 4 25 | 4 25 | 6 50 | 13 00 |

Fig. 2673



WALL GRIP

Used in connection with a wooden dry hole plug to prevent the plug from loosening.

Prices on specification.

STANDARD 1,000-LB. GAS PRESSURE GAUGES

| Size                               | Brass Case | N. P. Case |
|------------------------------------|------------|------------|
| 3-inch dial - - - - -              | \$20 00    | 20 60      |
| Morocco holder for above - - - - - |            | \$2 50     |

# MACKSBURG OR ARMOR PACKER

Fig. 2885



| Size of tubing, inches | Size of hole, inches | Length of rubber, inches | Weight, lbs. | Complete | PARTS       |            |           |                    |
|------------------------|----------------------|--------------------------|--------------|----------|-------------|------------|-----------|--------------------|
|                        |                      |                          |              |          | Rubber only | Frame only | Cone only | Cone with coupling |
| 2                      | 4 $\frac{1}{4}$      | 10                       | 27           | \$11 00  | 4 00        | 9 00       | 3 00      | 4 50               |
| 2                      | 4 $\frac{1}{4}$      | 12                       | 28           | 12 00    | 4 50        | 9 00       | 3 00      | 4 50               |
| 2                      | 4 $\frac{1}{2}$      | 10                       | 28           | 11 50    | 4 25        | 9 00       | 3 00      | 4 50               |
| 2                      | 4 $\frac{1}{2}$      | 12                       | 29           | 12 50    | 5 00        | 9 00       | 3 00      | 4 50               |
| 2                      | 4 $\frac{3}{8}$ or 5 | 10                       | 28           | 14 00    | 6 00        | 9 00       | 3 00      | 4 50               |
| 2                      | 4 $\frac{3}{8}$ or 5 | 12                       | 30           | 15 00    | 7 25        | 9 00       | 3 00      | 4 50               |
| 2                      | 5 $\frac{1}{8}$      | 10                       | 40           | 15 50    | 7 50        | 9 00       | 3 00      | 4 50               |
| 2                      | 5 $\frac{1}{8}$      | 12                       | 42           | 17 00    | 9 00        | 9 00       | 3 00      | 4 50               |
| 2                      | 5 $\frac{1}{8}$      | 9                        | 45           | 16 50    | 8 00        | 9 00       | 3 00      | 4 50               |
| 2                      | 5 $\frac{1}{8}$      | 10                       | 46           | 17 50    | 8 75        | 9 00       | 3 00      | 4 50               |
| 2                      | 5 $\frac{1}{8}$      | 12                       | 48           | 19 25    | 10 00       | 9 00       | 3 00      | 4 50               |
| 2                      | 5 $\frac{1}{8}$      | 16                       | 58           | 23 00    | 14 00       | 9 00       | 3 00      | 4 50               |
| 2                      | 6 or 6 $\frac{1}{4}$ | 10                       | 54           | 21 50    | 9 75        | 9 50       | 3 00      | 4 50               |
| 2                      | 6 or 6 $\frac{1}{4}$ | 12                       | 57           | 24 00    | 11 50       | 9 50       | 3 00      | 4 50               |
| 2                      | 6 or 6 $\frac{1}{4}$ | 16                       | 63           | 29 00    | 15 50       | 9 50       | 3 00      | 4 50               |
| 2                      | 6 $\frac{3}{8}$      | 10                       | 58           | 23 00    | 12 00       | 10 50      | 3 50      | 5 00               |
| 2                      | 6 $\frac{3}{8}$      | 12                       | 60           | 25 50    | 14 25       | 10 50      | 3 50      | 5 00               |
| 2                      | 6 $\frac{3}{8}$      | 16                       | 68           | 31 50    | 19 00       | 10 50      | 3 50      | 5 00               |
| 2                      | 7 $\frac{1}{8}$      | 10                       | 76           | 34 00    | 18 00       | 18 00      | 6 00      | 8 00               |
| 2                      | 7 $\frac{1}{8}$      | 12                       | 80           | 38 00    | 24 00       | 18 00      | 6 00      | 8 00               |
| 2                      | 7 $\frac{1}{8}$      | 16                       | 86           | 46 50    | 29 75       | 18 00      | 6 00      | 8 00               |
| 2                      | 8 or 8 $\frac{1}{4}$ | 10                       | 87           | 37 50    | 24 25       | 19 00      | 6 50      | 8 50               |
| 2                      | 8 or 8 $\frac{1}{4}$ | 12                       | 92           | 42 50    | 29 00       | 19 00      | 6 50      | 8 50               |
| 2                      | 8 or 8 $\frac{1}{4}$ | 16                       | 102          | 51 75    | 35 00       | 19 00      | 6 50      | 8 50               |
| 2                      | 11 $\frac{3}{8}$     | 12                       | 105          | 89 50    | 59 00       | 40 00      | 8 50      | 11 00              |
| 2 $\frac{1}{2}$        | 5 $\frac{1}{8}$      | 12                       | 50           | 25 50    | 9 00        | 12 50      | 4 50      | 6 00               |
| 2 $\frac{1}{2}$        | 6 or 6 $\frac{1}{4}$ | 12                       | 52           | 29 75    | 11 50       | 13 50      | 4 50      | 6 00               |
| 2 $\frac{1}{2}$        | 8 $\frac{1}{4}$      | 12                       | 84           | 47 00    | 26 00       | 27 50      | 6 00      | 8 00               |
| 3                      | 5 $\frac{1}{8}$      | 12                       | 65           | 22 25    | 8 00        | 12 50      | 4 50      | 6 00               |
| 3                      | 6 or 6 $\frac{1}{4}$ | 12                       | 69           | 25 75    | 11 50       | 14 00      | 4 50      | 6 00               |
| 3                      | 6 or 6 $\frac{1}{4}$ | 16                       | 77           | 36 00    | 14 50       | 14 00      | 4 50      | 6 00               |
| 3                      | 7 $\frac{1}{8}$      | 12                       | 85           | 37 50    | 18 00       | 31 50      | 6 00      | 8 00               |
| 3                      | 7 $\frac{1}{8}$      | 12                       | 87           | 40 00    | 20 75       | 35 00      | 6 00      | 8 00               |
| 3                      | 7 $\frac{1}{8}$      | 16                       | 90           | 44 50    | 26 00       | 35 00      | 6 00      | 8 00               |
| 3                      | 8 or 8 $\frac{1}{4}$ | 12                       | 98           | 44 50    | 23 00       | 35 00      | 7 00      | 9 00               |
| 3                      | 8 or 8 $\frac{1}{4}$ | 16                       | 106          | 48 00    | 28 75       | 35 00      | 7 00      | 9 00               |
| 3                      | 9 $\frac{1}{8}$      | 12                       | 102          | 55 50    | 36 00       | 40 00      | -----     | -----              |
| 3                      | 9 $\frac{1}{8}$      | 16                       | 110          | 66 00    | 45 00       | 40 00      | -----     | -----              |
| 4                      | 8 $\frac{1}{4}$      | 12                       | 100          | 44 00    | 22 00       | 42 00      | -----     | -----              |
| 4                      | 9 $\frac{1}{8}$      | 12                       | 110          | 55 00    | 34 00       | 46 00      | -----     | -----              |

Fig. 2899

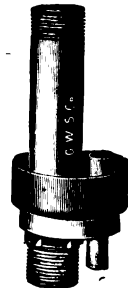


# HEINZ CUP PACKER—Fig. 2899

| Size tubing, inches | 1 $\frac{1}{4}$      | 2                    | 2                    | 2                    | 2                    | 2                    |
|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Size hole - - -     | 4                    | 3 $\frac{1}{4}$      | 4 $\frac{1}{4}$      | 5 $\frac{1}{8}$      | 6 $\frac{1}{4}$      | 7 $\frac{1}{4}$      |
| Price - - - -       | \$4 00               | 2 75                 | 2 75                 | 4 00                 | 4 25                 | 11 00                |
| Weight - - lbs.     | -----                | 7                    | 9                    | 16                   | 21                   | -----                |
| Size tubing, inches | 2                    | 2                    | 2 $\frac{1}{2}$      | 3 or 3 $\frac{1}{4}$ | 3 or 3 $\frac{1}{4}$ | 3 or 3 $\frac{1}{4}$ |
| Size hole - - -     | 8 $\frac{1}{4}$      | 8 $\frac{3}{8}$      | 5 $\frac{1}{8}$      | 5                    | 5 $\frac{1}{8}$      | 6 $\frac{1}{4}$      |
| Price - - - -       | \$12 50              | 13 25                | 5 00                 | 5 00                 | 5 00                 | 5 00                 |
| Weight - - lbs.     | -----                | -----                | 23                   | -----                | -----                | 9                    |
| Size tubing, inches | 4 or 4 $\frac{1}{4}$ | 4 or 4 $\frac{1}{4}$ | 5                    | 5 $\frac{1}{8}$      | 5 $\frac{1}{8}$      | 6 $\frac{1}{8}$      |
| Size hole - - -     | 5 $\frac{1}{8}$      | 6 or 6 $\frac{1}{4}$ | 6 or 6 $\frac{1}{4}$ | 6 or 6 $\frac{1}{4}$ | 8 or 8 $\frac{1}{4}$ | 8 or 8 $\frac{1}{4}$ |
| Price - - - -       | 7 00                 | 7 25                 | 8 50                 | 9 50                 | 9 50                 | 10 00                |
| Price two cup - - - | 9 00                 | 9 50                 | -----                | -----                | -----                | -----                |

Add for gas-pipe attachment, see fig. 2895 - - - - - \$0 50

Fig. 2895



With gas escape

## DRESSER PACKERS

## REGULAR

Fig. 2887



Fig. 2897



| Size of Tubing,<br>inches | Size of Hole,<br>inches | Length<br>of<br>Rubber | Weight,<br>lbs. | Complete | Rubber<br>only | Frame<br>only |
|---------------------------|-------------------------|------------------------|-----------------|----------|----------------|---------------|
| 2                         | 4                       | 10                     | 26              | \$12 00  | \$6 00         | \$6 00        |
| 2                         | 4                       | 16                     | 48              | 15 00    | 9 00           | 6 00          |
| 2                         | 4 1/4                   | 10                     | 26              | 12 00    | 6 00           | 6 00          |
| 2                         | 4 1/4                   | 16                     | 48              | 15 00    | 9 00           | 6 00          |
| 2                         | 4 1/2                   | 10                     | --              | 12 00    | 6 00           | 6 00          |
| 2                         | 4 1/2                   | 16                     | 48              | 16 00    | 10 00          | 6 00          |
| 2                         | 5                       | 10                     | 34              | 14 00    | 8 00           | 6 00          |
| 2                         | 5                       | 16                     | 43              | 18 00    | 12 00          | 6 00          |
| 2                         | 5 3/8                   | 16                     | --              | 21 00    | 14 00          | 7 00          |
| 2                         | 5 3/8                   | 10                     | --              | 17 00    | 10 00          | 7 00          |
| 2                         | 5 3/8                   | 13                     | 57              | 20 00    | 13 00          | 7 00          |
| 2                         | 5 3/8                   | 16                     | 58              | 22 00    | 15 00          | 7 00          |
| 2                         | 5 3/8                   | 16                     | 75              | 26 00    | 18 00          | 8 00          |
| 2                         | 6                       | 16                     | 75              | 26 00    | 16 00          | 10 00         |
| 2                         | 6 1/4                   | 16                     | 75              | 28 00    | 18 00          | 10 00         |
| 2 1/2                     | 4 1/4                   | 16                     | --              | 13 00    | 8 00           | 5 00          |
| 2 1/2                     | 4 1/2                   | 16                     | --              | 14 00    | 9 00           | 5 00          |
| 2 1/2                     | 5                       | 13                     | --              | 16 00    | 9 00           | 7 00          |
| 2 1/2                     | 5 3/8                   | 13                     | --              | 21 00    | 15 00          | 6 00          |
| 3                         | 5                       | 20                     | --              | 20 00    | 10 00          | 10 00         |
| 3                         | 5 3/8                   | 20                     | --              | 25 00    | 15 00          | 10 00         |
| 3                         | 5 3/8                   | 20                     | 63              | 26 00    | 15 00          | 11 00         |
| 3                         | 6                       | 20                     | --              | 30 00    | 19 00          | 11 00         |
| 3                         | 6 1/4                   | 20                     | --              | 32 00    | 21 00          | 11 00         |
| 3                         | 6 1/2                   | 16                     | 80              | 31 00    | 19 00          | 12 00         |
| 4                         | 5 3/8                   | 16                     | 73              | 30 00    | 10 00          | 20 00         |
| 4                         | 6 or 6 1/4              | 16                     | --              | 30 00    | 11 00          | 19 00         |
| 4                         | 6 1/2                   | 16                     | --              | 35 00    | 15 00          | 20 00         |
| 4 1/4, 5, 5 3/8           | 5 3/8, 6 1/4, 6 1/2     | 16                     | 40              | 30 00    | 10 00          | 20 00         |
| 5 3/8                     | 7 1/2 or 8              | 16                     | --              | 35 00    | 16 00          | 19 00         |
| 5 3/8                     | 8 1/4                   | 16                     | --              | 40 00    | 21 00          | 19 00         |
| 6 or 6 1/4                | 8 or 8 1/4              | 16                     | --              | 40 00    | 15 00          | 25 00         |
| 6 3/8                     | 8                       | 16                     | --              | 40 00    | 12 00          | 28 00         |
| 8                         | 10                      | 16                     | --              | 68 00    | 18 00          | 50 00         |

PUMPING  
PACKER  
WITH GAS  
ESCAPE

Fig. 2893



When specifying, be particular to state size of tubing, diameter of hole in which packer is to be used, and length of rubber.

## WALL FASTENER, WITHOUT PACKER

Not illustrated

|                |           |           |           |           |           |         |
|----------------|-----------|-----------|-----------|-----------|-----------|---------|
| 2 x 4 or 4 1/4 | - - - - - | - - - - - | - - - - - | - - - - - | - - - - - | \$14 00 |
| 2 x 5 3/8      | - - - - - | - - - - - | - - - - - | - - - - - | - - - - - | 15 00   |
| 3 x 5 3/8      | - - - - - | - - - - - | - - - - - | - - - - - | - - - - - | 16 00   |
| 4 1/4 x 5 3/8  | - - - - - | - - - - - | - - - - - | - - - - - | - - - - - | 17 00   |

## PONY PACKER

Fig. 2897

| Size, inches | Size of tubing,<br>inches | Complete | Rubber only | Coupling only |
|--------------|---------------------------|----------|-------------|---------------|
| 3/4          | 1 1/2                     | \$3 00   | \$1 00      | \$0 75        |
| 1            | 2                         | 4 00     | 1 50        | 75            |
| 1 1/4        | 2 1/2                     | 9 50     | 2 75        | 1 25          |
| 1            | 3                         | 10 50    | 4 00        | 1 50          |
| 1 1/4        | 3                         | 10 50    | 4 00        | 1 50          |

Used to pack in 2-inch tubing where gas pressure is not sufficient to force the oil to the surface.

**"SUCCESS" WELL PACKERS**

WITH RUBBER CUPS

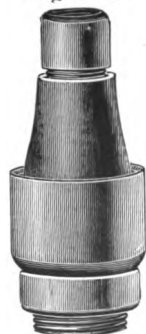
FOR TUBING AND CASING

PATENTED DEC. 8, 1903

Fig. 2884

Fig. 2882-A

Fig. 2882



Tubing Packer

Tubing Packer,  
with Gas Escape

Fig. 2883

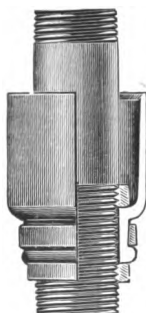
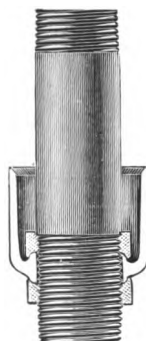
Style "A"  
Casing Packer

Fig. 2883-A

Style "B"  
Casing PackerDouble Packer for  
Top and Bottom  
of Sand

## LIST

| Size Tubing<br>or Casing | Size Hole for | Without Gas<br>Escape, each | With Gas<br>Escape, each | Double Packers,<br>each |
|--------------------------|---------------|-----------------------------|--------------------------|-------------------------|
| 2" Tubing                | 4½"           | \$8 50                      | - - -                    | - - - -                 |
| 2" "                     | 5"            | 8 50                        | - - -                    | - - - -                 |
| 2" "                     | 5½"           | 8 50                        | \$8 50                   | - - - -                 |
| 2" "                     | 6½"           | 8 50                        | 8 50                     | - - - -                 |
| 3" "                     | 5½"           | 8 50                        | - - -                    | - - - -                 |
| 3" "                     | 6½"           | 8 50                        | - - -                    | - - - -                 |
| 3½" Casing               | 5½"           | 9 50                        | - - -                    | - - - -                 |
| 3½" "                    | 6½"           | 9 50                        | - - -                    | - - - -                 |
| 4½" "                    | 5½"           | 9 50                        | - - -                    | - - - -                 |
| 4½" "                    | 6½"           | 9 50                        | - - -                    | - - - -                 |
| 5½" "                    | 8"            | - - -                       | - - -                    | \$11 00                 |
| 6½" "                    | 8"            | - - -                       | - - -                    | 11 00                   |





## BROODER GAS PACKER

**Fig 2891** Does not require any pipe below it. Can be anchored at any point desired. To expand the rubber the tubing is turned to the right; to release packer, turn to the left.



### REVISED LIST

| Size of tubing, inches | Size of hole, inches | Length of rubber, inches | Weight, lbs. | Complete | PARTS       |            |
|------------------------|----------------------|--------------------------|--------------|----------|-------------|------------|
|                        |                      |                          |              |          | Rubber only | Frame only |
| 2                      | 4 $\frac{7}{8}$ , 5  | 12                       | 32           | \$23 50  | 8 00        | 15 50      |
| 2                      | 5 $\frac{1}{8}$      | 12                       | 40           | 25 00    | 9 00        | 16 00      |
| 2                      | 5 $\frac{3}{8}$      | 15                       | 45           | 28 00    | 10 00       | 18 00      |
| 2                      | 6 $\frac{1}{4}$      | 12                       | 51           | 27 50    | 10 50       | 17 00      |
| 2                      | 6 $\frac{1}{4}$      | 15                       | 57           | 30 00    | 11 00       | 19 00      |
| 2                      | 6 $\frac{3}{8}$      | 15                       | 60           | 30 00    | 11 00       | 19 00      |
| 2                      | 7 $\frac{1}{8}$      | 15                       | 65           | 40 00    | 15 00       | 25 00      |
| 3                      | 5 $\frac{3}{8}$      | 12                       | 60           | 25 00    | 9 00        | 16 00      |
| 3                      | 5 $\frac{3}{8}$      | 15                       | 67           | 28 00    | 10 00       | 18 00      |
| 3                      | 6 $\frac{1}{4}$      | 15                       | 70           | 30 00    | 11 00       | 19 00      |
| 3                      | 7 $\frac{1}{8}$      | 15                       | 88           | 40 00    | 15 00       | 25 00      |
| 4                      | 8                    | 15                       | --           | 45 00    | 18 00       | 27 00      |
| 5 $\frac{1}{8}$        | 8                    | 15                       | --           | 45 00    | 18 00       | 27 00      |

For ball bearings on above up to 6 $\frac{3}{8}$ -inch hole, \$5.00 extra.

For ball bearings above 6 $\frac{3}{8}$ -inch hole, \$6.00 extra.

## WELL PACKERS

## BOTTOM HOLE PACKER

Fig. 2914



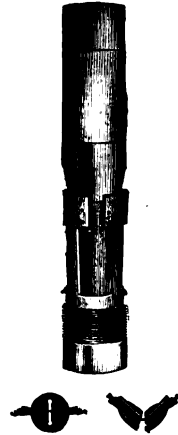
## DISC CAVE PACKER

Fig. 2909



## DISC WALL PACKER

Fig. 2906



For list and descriptions see page 290.

For list and description see page 291.

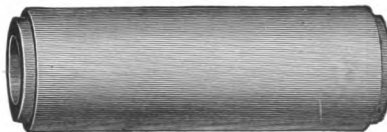
OIL  
PACKER  
Fig. 2903Packs by  
weight of  
casing

## SELF-SUPPORTING WALL PACKER

| Size of tubing,<br>inches | Size of hole,<br>inches | Weight, lbs. | Complete | Rubbers only |
|---------------------------|-------------------------|--------------|----------|--------------|
| 2 or 2½                   | 4, 4½ or 4¾             | 40 to 42     | \$35 00  | 6 00         |
| 3 or 3½                   | 4½, 4¾, 5, 5½           | 49 to 54     | 35 00    | 8 00         |
| 3½, 4½ or 4¾              | 5½ or 5¾                | 43 to 51     | 35 00    | 8 00         |
| 4½, 4¾ or 4¾              | 6                       | 50 to 58     | 40 00    | 8 00         |
| 4½, 4¾ or 4¾              | 6½ or 6¾                | 54 to 66     | 45 00    | 8 00         |
| 4½, 4¾ or 4¾              | 6½ or 6¾                | 57 to 68     | 50 00    | 10 00        |
| 5 or 5½                   | 6½ or 6¾                | 57 to 68     | 50 00    | 10 00        |
| 5½                        | 7½, 7¾ or 8             | 100 to 113   | 65 00    | 10 00        |
| 6                         | 8                       | 84           | 70 00    | 10 00        |
| 6½ or 6¾                  | 8 or 8½                 | 82 to 90     | 75 00    | 10 00        |
| 7½ or 8½                  | 10                      | 140          | 100 00   | -----        |
| 8½ or 10                  | 12                      | -----        | 125 00   | -----        |

## PACKER RUBBER

Fig. 2916



**WELL PACKERS****STANDARD LIST**

ADOPTED BY THE PACKER MANUFACTURERS, OCTOBER 10, 1907

**BOTTOM HOLE PACKERS**

Fig. 2914, page 289

| Size of Casing,<br>Inches | Size of Hole,<br>Inches | Length of<br>Rubber, Inches | Price of Rubber | Price, Complete |
|---------------------------|-------------------------|-----------------------------|-----------------|-----------------|
| 4½ or 4½                  | 5½                      | 10                          | \$5 00          | \$15 00         |
| 4½ or 4½                  | 6 or 6½                 | 10                          | 6 00            | 18 00           |
| 4½                        | 6½ or 6¾                | 10                          | 6 00            | 18 00           |
| 5½                        | 6¾                      | 10                          | 6 00            | 18 00           |
| 5½                        | 7½ or 7¾                | 10                          | 9 00            | 25 00           |
| 5½                        | 8 or 8½                 | 10                          | 10 00           | 28 00           |
| 6 or 6½                   | 8 or 8½                 | 10                          | 9 00            | 25 00           |
| 6½                        | 8 or 8½                 | 10                          | 9 00            | 25 00           |
| 6, 6½ or 6¾               | 8½                      | 10                          | 15 00           | 38 00           |
| 6½ or 6¾                  | 10                      | 13                          | 18 00           | 50 00           |
| 7¾                        | 9¾                      | 13                          | 18 00           | 45 00           |
| 8 or 8½                   | 10                      | 13                          | 18 00           | 45 00           |
| 9¾                        | 11¾                     | 13                          | 24 00           | 70 00           |
| 10                        | 13                      | 13                          | 27 00           | 80 00           |

**LARGER PACKERS MADE TO ORDER**

These prices are for Packers with shoe on bottom. The shoe is a support for the packer and prevents the shell from collapsing. Used on lower end of a string of casing that cannot be made tight in the ordinary way.

For threads on lower end of 4½" to 6¾" packers, add to list price \$2.00 each.

For threads on lower end of 7¾" to 8½" packers, add to list price \$4.00 each.

For Packers with Rubbers longer than 10" up to and including 6¾" hole, add \$1.00 per inch.

For 7¾" to 8½" inclusive, add \$1.50 per inch.

For Rubbers only longer than 10" up to and including 6¾" hole, add 75 cents per inch.

For 7¾" to 8½" inclusive, add \$1.00 per inch.

**DISC CAVE PACKERS**

Fig. 2909, page 289

| Size of Casing, Inches | Size of Hole, Inches | Price of Packer |
|------------------------|----------------------|-----------------|
| 3½, 4½, 4¾             | 4¾, 5½, 6½           | \$20 00         |
| 5¾                     | 6¾                   | 22 00           |
| 5¾                     | 7¾                   | 28 00           |
| 5¾, 6½, 6¾             | 8 or 8½              | 32 00           |

These Packers are used to shut off dry caves, requiring only enough casing to cover the cave. Wells can be drilled deeper or cleaned out through these Packers.

Letting-in Tool, 3½ to 5¾" inclusive, each - - - - - \$3 00

Letting-in Tool, 5¾ to 6¾" inclusive, each - - - - - 5 00

The above lists apply to Bottom Hole Packers and Cave Packers manufactured by

Larkin & Co.

C. M. Heeter, Sons & Co.

Larkin Bros.

Parkersburg Machine Co.

Spang & Co., Ltd.

B. Masseth Estate.

T. W. Phillips Mfg. Co.

Oil Well Supply Co.

**WELL PACKERS.****DISC WALL PACKERS.**

Fig. 2906, page 289.

| Size of Tubing<br>Inches   | Size of Hole<br>Inches | Length of<br>Rubber, in. | Price of<br>Rubber | Price of Packer<br>Complete |
|----------------------------|------------------------|--------------------------|--------------------|-----------------------------|
| 2, 2½, 3, 3½               | 4½, 4½, 4½, 4½         | 10                       | \$4 00             | \$18 00                     |
| 2, 2½, 3, 3½               | 5, 5, 5½, 5½           | 10                       | 5 00               | 18 00                       |
| 4, 4½                      | 5½, 5½                 | 10                       | 5 00               | 17 00                       |
| 4½                         | 5½, 5½                 | 10                       | 5 00               | 18 00                       |
| 2, 2½, 3, 3½               | 6, 6½, 6½              | 10                       | 6 00               | 21 00                       |
| 4, 4½, 4½, 4½, 5, 5½       | 6, 6½, 6½              | 10                       | 6 00               | 20 00                       |
| 2, 2½, 3, 3½, 4, 4½, 4½, 5 | 7½ or 7½               | 10                       | 9 00               | 34 00                       |
| 5½                         | 7½ or 7½               | 10                       | 9 00               | 32 00                       |
| 2, 2½, 3, 3½, 4, 4½, 4½, 5 | 8 or 8½                | 10                       | 10 00              | 34 00                       |
| 5½                         | 8 or 8½                | 10                       | 10 00              | 32 00                       |
| 6½, 6½                     | 8 or 8½                | 10                       | 9 00               | 32 00                       |
| 7½                         | 10                     | 13                       | 20 00              | 60 00                       |
| 8                          | 10                     | 13                       | 18 00              | 60 00                       |
| 10                         | 13                     | 16                       | 30 00              | 100 00                      |

For Packers with longer Rubbers than 10" up to and including 6½" hole, add \$1.00 per inch. For 7½" to 8½" inclusive, add \$1.50 per inch.

For Rubbers only longer than 10" up to and including 6½" add 75 cents per inch. For 7½" to 8½" inclusive, add \$1.00 per inch.

**DISC WALL PACKER PARTS.**

| Size<br>Inches | Size Hole<br>Inches | Collars | Cones  | Slips  | Springs | Bottom | Pipe   | Discs  |
|----------------|---------------------|---------|--------|--------|---------|--------|--------|--------|
| 2, 2½          | 4, 4½ or 4½         | \$2 00  | \$4 00 | \$3 00 | \$1 25  | \$2 00 | \$3 50 | \$0 25 |
| 2, 2½, 3, 3½   | 4½ or 4½            | 2 00    | 4 00   | 3 00   | 1 50    | 2 00   | 3 50   | 25     |
| 2, 2½, 3, 3½   | 5, 5½               | 2 00    | 4 00   | 3 00   | 1 50    | 2 00   | 3 50   | 25     |
| 2, 2½, 3, 3½   | 5½                  | 2 50    | 4 00   | 3 00   | 2 00    | 2 00   | 3 50   | 25     |
| 4, 4½          | 5½                  | 2 00    | 4 00   | 3 00   | 2 00    | 2 00   | 3 50   | 25     |
| 2, 2½, 3       | 6, 6½ or 6½         | 2 50    | 4 00   | 3 50   | 2 00    | 2 00   | 4 00   | 25     |
| 3½, 4, 4½      | 6, 6½ or 6½         | 2 50    | 4 00   | 3 50   | 2 00    | 2 00   | 4 00   | 25     |
| 4½             | 6, 6½ or 6½         | 2 50    | 4 00   | 3 50   | 2 00    | 2 00   | 4 00   | 25     |
| 2, 2½, 3, 3½   | 7½ or 7½            | 5 00    | 6 00   | 4 50   | 3 00    | 3 00   | 5 00   | 50     |
| 4, 4½, 5, 5½   | 7½ or 7½            | 3 50    | 6 00   | 4 50   | 3 00    | 3 00   | 5 00   | 50     |
| 2, 2½, 3, 3½   | 8 or 8½             | 5 00    | 6 00   | 5 00   | 3 00    | 3 00   | 5 00   | 50     |
| 4, 4½, 5, 5½   | 8 or 8½             | 4 00    | 6 00   | 5 00   | 3 00    | 3 00   | 5 00   | 50     |
| 5, 5½          | 6½                  | 2 50    | 4 00   | 3 50   | 2 00    | 2 50   | 4 00   | 25     |
| 6, 6½          | 8 or 8½             | 4 00    | 6 00   | 6 00   | 3 00    | 3 00   | 6 00   | 50     |
| 6½             | 8 or 8½             | 4 00    | 6 00   | 6 00   | 3 00    | 3 00   | 6 00   | 50     |
| 7½             | 10                  | 8 50    | 12 00  | 8 50   | 5 50    | 5 00   | 10 00  | 1 00   |
| 8              | 10                  | 7 00    | 11 00  | 8 00   | 5 00    | 5 00   | 10 00  | 1 00   |

The above lists apply to Disc Wall Packers and Parts manufactured by

Larkin &amp; Co.

C. M. Heeter, Sons &amp; Co.

Larkin Bros.

Parkersburg Machine Co.

Spang &amp; Co., Ltd.

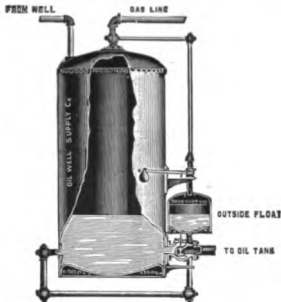
B. Masseth Estate.

T. W. Phillips Mfg. Co.

Oil Well Supply Co.

GAS TANKS

THE O. W. S. CO. AUTOMATIC HIGH PRESSURE—Fig. 3188



Every tank tested to 200 lbs. pressure. This tank is positive in its action and can be cleaned without disconnecting from lead and flow lines. All working parts on outside and easy of access for removing mud or other obstructions from valves.

|                            |                |               |
|----------------------------|----------------|---------------|
| Size - - - - inches        | 36 x 72        | 48 x 84       |
| Thickness of shell, inches | $\frac{5}{16}$ | $\frac{3}{8}$ |
| Weight - - - - lbs.        | 1,520          | 1,920         |
| Complete - - - -           | \$120 00       | 150 00        |

WILBUR'S AUTOMATIC LOW PRESSURE—Fig. 3185



Weight, 155 lbs.  
Capacity, 3 barrels

Fig. 3185, with 2-inch connections - \$25 00  
Fig. 3185, with 2½-inch connections - 27 50

WASHINGTON AUTOMATIC

|                             |         |         |         |         |
|-----------------------------|---------|---------|---------|---------|
| Size - inches               | 26 x 48 | 36 x 66 | 36 x 72 | 48 x 84 |
| With valve and shut-off - - | \$32 00 | 58 00   | 65 00   | 120 00  |

OIL STORAGE AND TRANSPORTATION

PORTABLE STEEL STORAGE TANK

| CAPACITY   | SIZE          | WEIGHT     | PRICE    |
|------------|---------------|------------|----------|
| 70 barrels | 8 ft. x 8 ft. | 2,750 lbs. | \$152 00 |

These tanks are built of the best open hearth steel,  $\frac{1}{8}$  inch thick. Bottoms and tops are flanged. They are equipped with a 16-inch nozzle on top, a 16-inch man-hole on the side, near bottom, a 2-inch flange on side, near bottom, for attaching pipe line, a 1-inch tap in bottom, close to the edge, for drawing off water. NOTE: This is the largest tank that can be conveniently handled in transportation, either by rail or wagon road. Four of these tanks can be loaded on an ordinary open freight car. The actual weight will closely approximate 12,000 pounds, or the minimum weight for this class, to which car lot rates may be applied.

Fig. 3018



Front view

OIL THIEF

|                                               |         |         |
|-----------------------------------------------|---------|---------|
| Fig. 3018, 12 inch complete with leather case | - - - - | \$45 00 |
| 12 " " " less " " " " " "                     | - - - - | 35 00   |
| 24 " " " " " " " " " "                        | - - - - | 48 00   |

WATSON PATENT BARREL FILLER

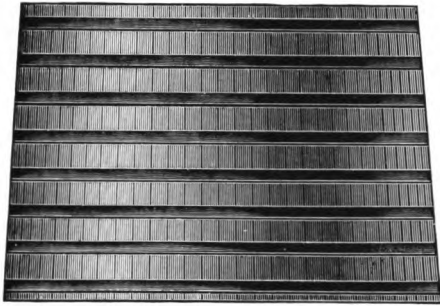
Fig. 3038

|                  |          |
|------------------|----------|
| Weight - - - - - | 7.5 lbs. |
| Price - - - - -  | \$25 00  |



Fig. 3038

## OIL STORAGE AND TRANSPORTATION



WOODEN TANK

Fig. 3189

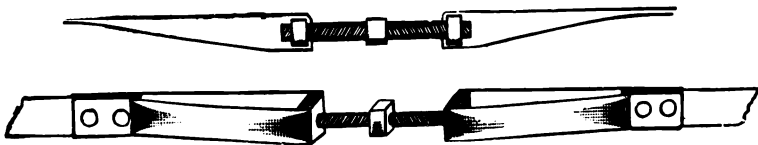
Made to order. Prices furnished on application.

42 gallons equal one barrel, standard oil measurement.

## DIMENSIONS AND WEIGHTS

| Diameter, feet | Length of staves, feet | Number of hoops | Capacity, gallons | Shipping weight, lbs. | Diameter, feet | Length of staves, feet | Number of hoops | Capacity, gallons | Shipping weight, lbs. |
|----------------|------------------------|-----------------|-------------------|-----------------------|----------------|------------------------|-----------------|-------------------|-----------------------|
| 3              | 3                      | 3               | 158               | 220                   | 12             | 12                     | 12              | 9,658             | 3,091                 |
| 4              | 4                      | 4               | 321               | 361                   | 13             | 6                      | 6               | 5,378             | 2,138                 |
| 5              | 4                      | 4               | 587               | 505                   | 13             | 8                      | 8               | 7,363             | 2,556                 |
| 6              | 4                      | 4               | 720               | 586                   | 13             | 12                     | 12              | 11,333            | 3,481                 |
| 6              | 6                      | 5               | 1,145             | 776                   | 14             | 8                      | 8               | 8,540             | 2,765                 |
| 7              | 4                      | 4               | 983               | 694                   | 14             | 12                     | 12              | 13,146            | 3,796                 |
| 7              | 6                      | 5               | 1,559             | 921                   | 14             | 14                     | 13              | 15,449            | 4,280                 |
| 8              | 4                      | 4               | 1,294             | 840                   | 15             | 6                      | 5               | 7,160             | 2,530                 |
| 8              | 6                      | 5               | 2,031             | 1,096                 | 15             | 8                      | 8               | 9,804             | 3,093                 |
| 8              | 8                      | 7               | 2,781             | 1,372                 | 15             | 12                     | 12              | 15,090            | 4,130                 |
| 9              | 4                      | 4               | 1,623             | 971                   | 15             | 16                     | 15              | 19,070            | 4,943                 |
| 9              | 6                      | 5               | 2,577             | 1,260                 | 16             | 6                      | 5               | 8,147             | 2,686                 |
| 9              | 8                      | 8               | 3,529             | 1,553                 | 16             | 8                      | 8               | 11,155            | 3,370                 |
| 10             | 4                      | 4               | 2,006             | 1,124                 | 16             | 12                     | 12              | 17,170            | 4,529                 |
| 10             | 6                      | 5               | 3,182             | 1,454                 | 16             | 14                     | 13              | 20,179            | 4,080                 |
| 10             | 8                      | 8               | 4,357             | 1,784                 | 16             | 16                     | 16              | 23,187            | 5,678                 |
| 11             | 4                      | 4               | 2,428             | 1,307                 | 18             | 8                      | 8               | 14,118            | 4,091                 |
| 11             | 6                      | 5               | 3,850             | 1,679                 | 18             | 12                     | 12              | 21,730            | 5,370                 |
| 11             | 8                      | 8               | 5,272             | 2,079                 | 18             | 16                     | 16              | 29,184            | 6,750                 |
| 12             | 4                      | 4               | 2,891             | 1,414                 | 20             | 14                     | 14              | 31,334            | 6,850                 |
| 12             | 6                      | 5               | 4,582             | 1,843                 | 20             | 16                     | 16              | 36,035            | 7,734                 |
| 12             | 8                      | 8               | 6,274             | 2,280                 | 24             | 16                     | 16              | 51,889            | 10,400                |
| 11             | 11                     | 10              | 7,405             | 2,632                 | --             | --                     | --              | --                | --                    |

## TANK HOOP CONNECTION—WARE'S PATENT—Fig. 3197



To tighten the hoops of wooden tanks

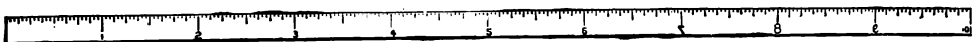
Complete - - - - \$1 00

Bolt only - - - - \$0 50

Straps only, per pair \$0 50

## GAUGE ROD—Fig. 3199

For measuring oil in tank



Per foot - - - - - \$0 20

## OIL STORAGE AND TRANSPORTATION

## STEEL STORAGE TANK

Fig. 3191



## SPECIFICATIONS OF STEEL TANKS

Ranging from 150 barrels to 35,000 barrels capacity, to hold either crude or refined petroleum. If tanks are required for water or liquids heavier than petroleum, heavier iron should be used.

## SPECIFICATIONS OF OIL STORAGE TANKS

| Capacity (barrels of 42 gallons each), about | 150                   | 200                   | 250                   | 300                   |
|----------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Diameter - - - - - feet                      | 9                     | 14                    | 14                    | 14                    |
| Height - - - - - feet                        | 14                    | 8                     | 10                    | 12                    |
| Number of rings in shell - - - - -           | 3                     | 2                     | 2                     | 3                     |
| Thickness of first ring (B. W. G.) - - -     | No. 7                 | No. 7                 | No. 7                 | No. 7                 |
| Thickness of second ring - - - - -           | No. 8                 | No. 8                 | No. 8                 | No. 8                 |
| Thickness of third ring - - - - -            | No. 8                 | -----                 | -----                 | No. 8                 |
| Thickness of bottom - - - - -                | No. 8                 | No. 8                 | No. 8                 | No. 8                 |
| Size of bottom angle - - - - - inches        | 2 x 2 x $\frac{1}{4}$ | 2 x 2 x $\frac{1}{4}$ | 2 x 2 x $\frac{1}{4}$ | 2 x 2 x $\frac{1}{4}$ |
| Size of top angle - - - - - inches           | 2 x 2 x $\frac{1}{4}$ | 2 x 2 x $\frac{1}{4}$ | 2 x 2 x $\frac{1}{4}$ | 2 x 2 x $\frac{1}{4}$ |
| Thickness of sheets for tight riveted roof - | No. 12                | No. 12                | No. 12                | No. 12                |

| Capacity (barrels of 42 gallons each), about | 350                   | 400                                                | 500                                                | ----- |
|----------------------------------------------|-----------------------|----------------------------------------------------|----------------------------------------------------|-------|
| Diameter - - - - - feet                      | 14                    | 18                                                 | 18                                                 | ----- |
| Height - - - - - feet                        | 14                    | 9 $\frac{1}{2}$                                    | 12                                                 | ----- |
| Number of rings in shell - - - - -           | 3                     | 2                                                  | 3                                                  | ----- |
| Thickness of first ring (B. W. G.) - - -     | No. 7                 | No. 7                                              | No. 6                                              | ----- |
| Thickness of second ring - - - - -           | No. 8                 | No. 8                                              | No. 7                                              | ----- |
| Thickness of third ring - - - - -            | No. 8                 | -----                                              | No. 8                                              | ----- |
| Thickness of bottom - - - - -                | No. 7                 | No. 7                                              | No. 7                                              | ----- |
| Size of bottom angle - - - - - inches        | 2 x 2 x $\frac{1}{4}$ | 2 $\frac{1}{2}$ x 2 $\frac{1}{2}$ x $\frac{5}{16}$ | 2 $\frac{1}{2}$ x 2 $\frac{1}{2}$ x $\frac{5}{16}$ | ----- |
| Size of top angle - - - - - inches           | 2 x 2 x $\frac{1}{4}$ | 2 x 2 x $\frac{1}{4}$                              | 2 x 2 x $\frac{1}{4}$                              | ----- |
| Thickness of sheets for tight riveted roof - | No. 12                | No. 12                                             | No. 12                                             | ----- |

| Capacity (barrels of 42 gallons each) - - about | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 10,000 |
|-------------------------------------------------|-------|-------|-------|-------|-------|--------|
| Diameter - - - - - feet                         | 30    | 30    | 30    | 35    | 43    | 54     |
| Height - - - - - feet                           | 8     | 16    | 24    | 24    | 20    | 25     |
| Number of rings in shell - - - - -              | 2     | 4     | 5     | 5     | 4     | 6      |
| Thickness of first ring (B. W. G.) - - -        | No. 7 | No. 5 | No. 3 | No. 3 | No. 3 | No. 3  |
| Thickness of second ring - - - - -              | No. 8 | No. 6 | No. 4 | No. 4 | No. 4 | No. 3  |
| Thickness of third ring - - - - -               | ----- | No. 7 | No. 5 | No. 5 | No. 5 | No. 4  |
| Thickness of fourth ring - - - - -              | ----- | No. 8 | No. 6 | No. 6 | No. 6 | No. 5  |

## OIL STORAGE AND TRANSPORTATION

## SPECIFICATIONS OF STEEL TANKS—Continued

| Thickness of 5th ring                      | - | - | - | - | - | - | - | - | - | No. 7 | No. 7 | No. 7 | No. 6       |
|--------------------------------------------|---|---|---|---|---|---|---|---|---|-------|-------|-------|-------------|
| Thickness of 6th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | No. 7       |
| Thickness of 7th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | No. 7       |
| Thickness of bottom plates                 | - | - | - | - | - | - | - | - | - | -     | -     | -     | No. 7       |
| Thickness of sketch plates                 | - | - | - | - | - | - | - | - | - | -     | -     | -     | No. 7       |
| Side of bottom angle                       | - | - | - | - | - | - | - | - | - | -     | -     | -     | 2½ x 2½ x ¾ |
| Size of top angle                          | - | - | - | - | - | - | - | - | - | -     | -     | -     | 2 x 2 x ½   |
| Thickness of sheets for light nailed roof  | - | - | - | - | - | - | - | - | - | -     | -     | -     | No. 20      |
| Thickness of sheets for tight riveted roof | - | - | - | - | - | - | - | - | - | -     | -     | -     | No. 12      |
| Capacity, (barrels of 42 gallons each)     | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Diameter                                   | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Height                                     | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| No. of rings in shell                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 1st ring (B. W. G.)           | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 2d ring                       | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 3d ring                       | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 4th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 5th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 6th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 7th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of bottom plates                 | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of sketch plates                 | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Size of bottom angle                       | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Size of top angle                          | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of sheets for light nailed roof  | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of sheets for tight riveted roof | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Capacity, (barrels of 42 gallons each)     | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Diameter                                   | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Height                                     | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| No. of rings in shell                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 1st ring (B. W. G.)           | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 2d ring                       | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 3d ring                       | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 4th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 5th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 6th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of 7th ring                      | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of bottom plates                 | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of sketch plates                 | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Size of bottom angle                       | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Size of top angle                          | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of sheets for light nailed roof  | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |
| Thickness of sheets for tight riveted roof | - | - | - | - | - | - | - | - | - | -     | -     | -     | -           |

Tanks are provided with a man-hole on the first ring, also an outlet flange, and tanks with roofs are provided with an additional man-hole on roof.

The above are "standard" specifications of steel tanks for storage purposes.

In rating the capacity of tanks, an allowance is made for the "deadwood" or timbers supporting the roof.

We furnish plans, specifications and estimates on iron or steel tanks of any size or style, for any purpose.

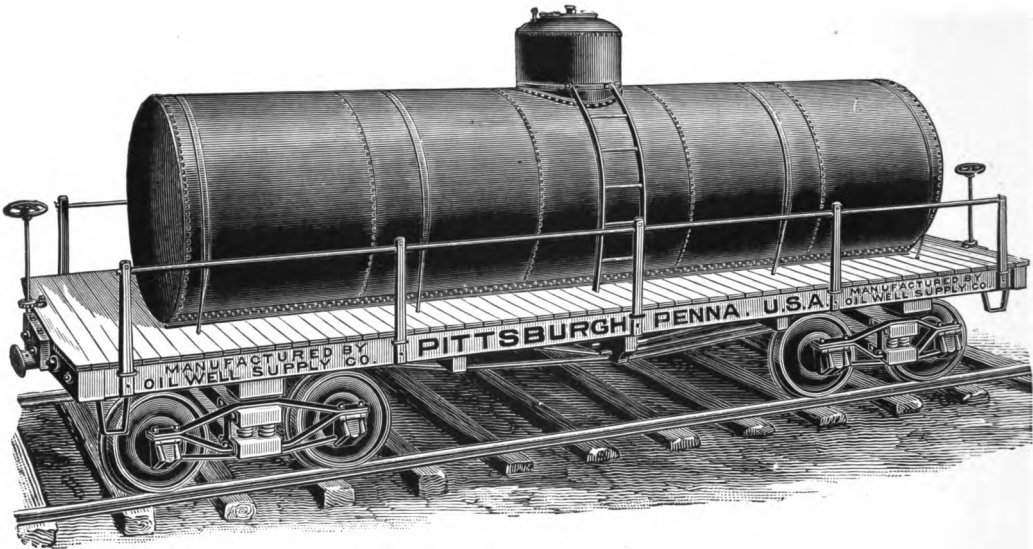
Any information in regard to this class of work will be cheerfully furnished. Prices on application.



OIL STORAGE AND TRANSPORTATION

TANK CAR

Fig. 3195



We furnish tank cars in any size with steel tanks from 4,000 to 6,600 gallons, mounted on trucks of 40,000 and 60,000 pounds carrying capacity, master car builders' standard, with air brakes. Prices furnished on specification.

STEEL SHIPPING DRUM

PLAIN—ASBESTOS PAINTED OUTSIDE

Fig. 3196



With heavy hoops for rolling

| Capacity,<br>gallons | DIMENSIONS OVER ALL |                | Weight,<br>pounds | Price  |
|----------------------|---------------------|----------------|-------------------|--------|
|                      | Diam. inches        | Height, inches |                   |        |
| 5½                   | 11½                 | 17½            | 17.7              | \$2 50 |
| 10½                  | 14                  | 20½            | 21                | 3 25   |
| 15½                  | 15½                 | 22½            | 30                | 4 25   |
| 20½                  | 17½                 | 26½            | 34.5              | 5 25   |
| 25½                  | 18½                 | 28½            | 41.5              | 6 25   |
| 30½                  | 18½                 | 29½            | 36                | 7 25   |

GALVANIZED—INSIDE AND OUT

|     |     |     |      |      |
|-----|-----|-----|------|------|
| 5½  | 11½ | 17½ | 19   | 3 25 |
| 10½ | 14  | 20½ | 27   | 4 25 |
| 15½ | 15½ | 22½ | 34   | 5 50 |
| 20½ | 17½ | 26½ | 39.5 | 7 00 |
| 25½ | 18½ | 28½ | 48.5 | 8 50 |
| 30½ | 18½ | 29½ | 36   | 9 50 |

Fig. 5421

BOTTLES FOR SAMPLES OF OIL

With mailing case



|                    |           |        |      |      |      |
|--------------------|-----------|--------|------|------|------|
| Capacity           | ounces    | 1      | 2    | 4    | 8    |
| Bottles only       | per dozen | \$0 60 | 60   | 75   | 1 10 |
| Mailing cases only | per dozen | 1 75   | 2 10 | 2 80 | ---- |
| Corks              | per gross | ----   | ---- | ---- | 1 65 |

# MANUFACTURERS' STANDARD LIST OF MACHINE BOLTS

With square heads and square nuts, finished points. Adopted September 20, 1899, to take effect

**SQUARE NUT**

October 1, 1899.

**HEXAGON NUT**

Fig. 5546

Fig. 5544



Price per hundred

££

| Length in inches                | $\frac{1}{4}$ | $\frac{5}{16}$ | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ & $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1     | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
|---------------------------------|---------------|----------------|---------------|----------------|---------------|--------------------------------|---------------|---------------|-------|----------------|----------------|
| $\frac{3}{4}$ to $1\frac{1}{2}$ | \$1 70        | 2 00           | 2 40          | 2 80           | 3 60          | 5 20                           | 7 20          | 10 50         | 15 10 | 22 50          | 30 00          |
| 2                               | 1 78          | 2 12           | 2 56          | 3 00           | 3 86          | 5 58                           | 7 70          | 11 20         | 16 00 | 23 70          | 31 50          |
| $2\frac{1}{2}$                  | 1 86          | 2 24           | 2 72          | 3 20           | 4 12          | 5 96                           | 8 20          | 11 90         | 16 90 | 24 90          | 33 00          |
| 3                               | 1 94          | 2 36           | 2 88          | 3 40           | 4 38          | 6 34                           | 8 70          | 12 60         | 17 80 | 26 10          | 34 50          |
| $3\frac{1}{2}$                  | 2 02          | 2 48           | 3 04          | 3 60           | 4 64          | 6 72                           | 9 20          | 13 30         | 18 70 | 27 30          | 36 00          |
| 4                               | 2 10          | 2 60           | 3 20          | 3 80           | 4 90          | 7 10                           | 9 70          | 14 00         | 19 60 | 28 50          | 37 50          |
| $4\frac{1}{2}$                  | 2 18          | 2 72           | 3 36          | 4 00           | 5 16          | 7 48                           | 10 20         | 14 70         | 20 50 | 29 70          | 39 00          |
| 5                               | 2 26          | 2 84           | 3 52          | 4 20           | 5 42          | 7 86                           | 10 70         | 15 40         | 21 40 | 30 90          | 40 50          |
| $5\frac{1}{2}$                  | 2 34          | 2 96           | 3 68          | 4 40           | 5 68          | 8 24                           | 11 20         | 16 10         | 22 30 | 32 10          | 42 00          |
| 6                               | 2 42          | 3 08           | 3 84          | 4 60           | 5 94          | 8 62                           | 11 70         | 16 80         | 23 20 | 33 30          | 43 50          |
| $6\frac{1}{2}$                  | 2 50          | 3 20           | 4 00          | 4 80           | 6 20          | 9 00                           | 12 20         | 17 50         | 24 10 | 34 50          | 45 00          |
| 7                               | 2 58          | 3 32           | 4 16          | 5 00           | 6 46          | 9 38                           | 12 70         | 18 20         | 25 00 | 35 70          | 46 50          |
| $7\frac{1}{2}$                  | 2 66          | 3 44           | 4 32          | 5 20           | 6 72          | 9 76                           | 13 20         | 18 90         | 25 50 | 36 90          | 48 00          |
| 8                               | 2 74          | 3 56           | 4 48          | 5 40           | 6 98          | 10 14                          | 13 70         | 19 60         | 26 80 | 38 10          | 49 50          |
| 9                               | 2 90          | 3 80           | 4 80          | 5 80           | 7 50          | 10 90                          | 14 70         | 21 00         | 28 60 | 40 50          | 52 50          |
| 10                              | 3 06          | 4 04           | 5 12          | 6 20           | 8 02          | 11 66                          | 15 70         | 22 40         | 30 40 | 42 90          | 55 50          |
| 11                              | 3 22          | 4 28           | 5 44          | 6 60           | 8 54          | 12 42                          | 16 70         | 23 80         | 32 20 | 45 30          | 58 50          |
| 12                              | 3 38          | 4 52           | 5 76          | 7 00           | 9 06          | 13 18                          | 17 70         | 25 20         | 34 00 | 47 70          | 61 50          |
| 13                              | 3 54          | 4 76           | 6 08          | 7 40           | 9 58          | 13 94                          | 18 70         | 26 60         | 35 80 | 50 10          | 64 50          |
| 14                              | 3 70          | 5 00           | 6 40          | 7 80           | 10 10         | 14 70                          | 19 70         | 28 00         | 37 60 | 52 50          | 67 50          |
| 15                              | 3 86          | 5 24           | 6 72          | 8 20           | 10 62         | 15 46                          | 20 70         | 29 40         | 39 40 | 54 90          | 70 50          |
| 16                              | 4 02          | 5 48           | 7 04          | 8 60           | 11 14         | 16 22                          | 21 70         | 30 80         | 41 20 | 57 30          | 73 50          |
| 17                              | 4 18          | 5 72           | 7 36          | 9 00           | 11 66         | 16 98                          | 22 70         | 32 20         | 43 00 | 59 70          | 76 50          |
| 18                              | 4 34          | 5 96           | 7 68          | 9 40           | 12 18         | 17 74                          | 23 70         | 33 60         | 44 80 | 62 10          | 79 50          |
| 19                              | 4 50          | 6 20           | 8 00          | 9 80           | 12 70         | 18 50                          | 24 70         | 35 00         | 46 60 | 64 50          | 82 50          |
| 20                              | 4 66          | 6 44           | 8 32          | 10 20          | 13 22         | 19 26                          | 25 70         | 36 40         | 48 40 | 66 90          | 85 50          |
| 21                              | -----         | -----          | -----         | -----          | -----         | -----                          | 26 70         | 37 80         | 50 20 | 69 30          | 88 50          |
| 22                              | -----         | -----          | -----         | -----          | -----         | -----                          | 27 70         | 39 20         | 52 00 | 71 70          | 91 50          |
| 23                              | -----         | -----          | -----         | -----          | -----         | -----                          | 28 70         | 40 60         | 53 80 | 74 10          | 94 50          |
| 24                              | -----         | -----          | ££            | -----          | -----         | -----                          | 29 70         | 42 00         | 55 60 | 76 50          | 97 50          |
| 25                              | -----         | -----          | -----         | -----          | -----         | -----                          | 30 70         | 43 40         | 57 40 | 78 90          | 100 50         |
| 26                              | -----         | -----          | -----         | -----          | -----         | -----                          | 31 70         | 44 80         | 59 20 | 81 30          | 103 50         |
| 27                              | -----         | -----          | -----         | -----          | -----         | -----                          | 32 70         | 46 20         | 61 00 | 83 70          | 106 50         |
| 28                              | -----         | -----          | -----         | -----          | -----         | -----                          | 33 70         | 47 60         | 62 80 | 86 10          | 109 50         |
| 29                              | -----         | -----          | -----         | -----          | -----         | -----                          | 34 70         | 49 00         | 64 60 | 88 50          | 112 50         |
| 30                              | -----         | -----          | -----         | -----          | -----         | -----                          | 35 70         | 50 40         | 66 40 | 90 90          | 115 50         |

The following extras are to be understood as a part of this list: Bolts with hexagon heads or hexagon nuts, 10 per cent extra. If both hexagon heads and hexagon nuts, 20 per cent extra. Joint bolts with oblong nuts 10 per cent, bolts with tee heads, askew heads and eccentric heads, 20 per cent extra. Key bolts, 20 per cent extra. Bolts with cotter holes, 25 per cent extra. Special bolts with irregular threads and unusual dimensions of heads or nuts will be charged extra at the discretion of the manufacturer. For weights, see page 298.

## EYE BOLTS—Not illustrated

| Diameter - - - - inches | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1    | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
|-------------------------|---------------|---------------|---------------|------|----------------|----------------|
| 12 inches long - - - -  | \$1 20        | 1 25          | 1 30          | 1 35 | 1 45           | 1 65           |
| 14 inches long - - - -  | 1 25          | 1 30          | 1 35          | 1 40 | 1 55           | 1 75           |
| 16 inches long - - - -  | 1 30          | 1 35          | 1 40          | 1 45 | 1 65           | 1 85           |
| 18 inches long - - - -  | 1 35          | 1 40          | 1 45          | 1 50 | 1 75           | 2 00           |

## AVERAGE WEIGHT OF MACHINE BOLTS, WITH SQUARE NUTS, POUNDS PER 100

| Length,<br>inches | DIAMETER, INCHES |                |               |                |               |                |               |                |               |     |
|-------------------|------------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|-----|
|                   | $\frac{1}{8}$    | $\frac{3}{16}$ | $\frac{1}{4}$ | $\frac{5}{16}$ | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | $\frac{5}{8}$ | 1   |
| 1½                | 3.9              | 6.2            | 9.7           | 14.7           | 20.4          | 26             | 37            | 58             | ---           | --- |
| 2                 | 4.6              | 7.2            | 11.3          | 16.5           | 22.4          | 29             | 40            | 63             | 98            | 145 |
| 2½                | 5.4              | 8.2            | 13            | 18.5           | 25            | 32             | 44            | 69             | 106           | 153 |
| 3                 | 6.2              | 9.3            | 14.5          | 20.5           | 28            | 35             | 48            | 75             | 114           | 163 |
| 3½                | 6.9              | 10.4           | 16            | 22.6           | 31            | 39             | 53            | 81             | 122           | 174 |
| 4                 | 7.6              | 11.5           | 17.7          | 25             | 33.5          | 42             | 58            | 88             | 130           | 185 |
| 4½                | 8.3              | 12.6           | 19.2          | 27             | 36            | 45             | 61            | 94             | 138           | 196 |
| 5                 | 9                | 13.7           | 21            | 29             | 39            | 49             | 65            | 100            | 147           | 207 |
| 5½                | 9.7              | 14.8           | 22.2          | 31             | 42            | 52             | 69            | 106            | 155           | 218 |
| 6                 | 10.4             | 16             | 23.7          | 33             | 45            | 55             | 73            | 112            | 163           | 229 |
| 6½                | 11               | 17             | 25            | 35             | 47            | 59             | 78            | 118            | 172           | 240 |
| 7                 | 11.8             | 18             | 27            | 37             | 50            | 62             | 82            | 124            | 180           | 251 |
| 7½                | 12.5             | 19             | 28            | 39             | 53            | 65             | 86            | 131            | 187           | 262 |
| 8                 | 13.2             | 20.3           | 30            | 42             | 56            | 69             | 90            | 137            | 195           | 273 |
| 9                 | ---              | ---            | 33            | 46             | 62            | 75             | 98            | 149            | 212           | 295 |
| 10                | ---              | ---            | 37            | 50             | 67            | 82             | 106           | 161            | 229           | 317 |
| 11                | ---              | ---            | 40            | 54             | 73            | 89             | 115           | 173            | 246           | 339 |
| 12                | ---              | ---            | 43.5          | 58             | 78            | 96             | 123           | 184            | 263           | 361 |
| 13                | ---              | ---            | ---           | ---            | 84            | 102            | 131           | 197            | 280           | 383 |
| 14                | ---              | ---            | ---           | ---            | 89            | 109            | 140           | 209            | 297           | 405 |
| 15                | ---              | ---            | ---           | ---            | 95            | 116            | 148           | 221            | 314           | 427 |
| 16                | ---              | ---            | ---           | ---            | 100           | 123            | 157           | 233            | 331           | 449 |
| 17                | ---              | ---            | ---           | ---            | 106           | 130            | 165           | 245            | 348           | 471 |
| 18                | ---              | ---            | ---           | ---            | 111*          | 137            | 174           | 258            | 365           | 493 |
| 19                | ---              | ---            | ---           | ---            | 117           | 144            | 182           | 270            | 382           | 515 |
| 20                | ---              | ---            | ---           | ---            | 122           | 151            | 191           | 282            | 399           | 537 |
| 21                | ---              | ---            | ---           | ---            | ---           | ---            | 198           | 294            | 416           | 559 |
| 22                | ---              | ---            | ---           | ---            | ---           | ---            | 206           | 306            | 437           | 581 |
| 23                | ---              | ---            | ---           | ---            | ---           | ---            | 215           | 318            | 454           | 603 |
| 24                | ---              | ---            | ---           | ---            | ---           | ---            | 224           | 330            | 470           | 625 |

## AVERAGE WEIGHT OF COACH OR LAG SCREWS, POUNDS PER 100

| Length,<br>inches | DIAMETER, INCHES |                |               |                |               |                |               |                |     |
|-------------------|------------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|-----|
|                   | $\frac{1}{8}$    | $\frac{3}{16}$ | $\frac{1}{4}$ | $\frac{5}{16}$ | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | 1   |
| 1½                | 4.2              | 6.5            | 9.2           | 13             | ---           | ---            | ---           | ---            | --- |
| 1¾                | 4.7              | 7.1            | 10            | 13.8           | ---           | ---            | ---           | ---            | --- |
| 2                 | 5.2              | 7.7            | 10.9          | 14.9           | 23            | 24.8           | ---           | ---            | --- |
| 2¼                | 5.7              | 8.4            | 11.8          | 16             | 24.5          | 27.3           | ---           | ---            | --- |
| 2½                | 6.2              | 9.2            | 12.7          | 17.4           | 26            | 29             | 43            | ---            | --- |
| 3                 | 7.2              | 10.6           | 14.6          | 19             | 29.2          | 33             | 48            | 75             | --- |
| 3½                | 8.2              | 12             | 16.6          | 21.5           | 32.5          | 36.9           | 54            | 79             | 90  |
| 4                 | 9.2              | 13.5           | 18.8          | 24             | 36            | 41             | 60            | 82             | 99  |
| 4½                | 10.2             | 15             | 20.7          | 26.5           | 39            | 45             | 66            | 86             | 108 |
| 5                 | 11.3             | 16.5           | 22.8          | 29             | 43            | 49             | 72            | 90             | 118 |
| 5½                | 12.4             | 18             | 25            | 31.5           | 46            | 53             | 78            | 98             | 128 |
| 6                 | 13.5             | 19.5           | 27            | 34             | 50            | 57             | 84            | 106            | 138 |
| 7                 | ---              | ---            | 31            | 39             | 56            | 65             | 96            | 123            | 158 |
| 8                 | ---              | ---            | 35            | 44             | 63            | 73             | 108           | 139            | 178 |
| 9                 | ---              | ---            | ---           | 49             | 70            | 81             | 120           | 156            | 198 |
| 10                | ---              | ---            | ---           | 54             | 77            | 89             | 131           | 172            | 219 |
| 11                | ---              | ---            | ---           | ---            | 83            | 97             | 143           | 189            | 240 |
| 12                | ---              | ---            | ---           | ---            | 91            | 105            | 155           | 205            | 261 |

## CARRIAGE BOLTS

## MANUFACTURERS' LIST

Fig. 5552



## PRICE PER HUNDRED

Adopted January 22, 1902, to take effect February 1, 1902.

| Length          | $\frac{1}{4}$ | $\frac{5}{16}$ | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ and $\frac{5}{8}$ | $\frac{3}{4}$ |
|-----------------|---------------|----------------|---------------|----------------|---------------|----------------------------------|---------------|
| 1 $\frac{1}{2}$ | \$1 00        | 1 20           | 1 60          | 2 20           | ----          | ----                             | ----          |
| 1 $\frac{3}{4}$ | 1 04          | 1 25           | 1 68          | 2 29           | ----          | ----                             | ----          |
| 2               | 1 08          | 1 30           | 1 76          | 2 38           | ----          | ----                             | ----          |
| 2 $\frac{1}{4}$ | 1 12          | 1 35           | 1 84          | 2 47           | ----          | ----                             | ----          |
| 2 $\frac{1}{2}$ | 1 16          | 1 40           | 1 92          | 2 56           | 3 00          | 5 20                             | 7 20          |
| 2 $\frac{3}{4}$ | 1 20          | 1 45           | 2 00          | 2 65           | 3 11          | 5 37                             | 7 43          |
| 3               | 1 24          | 1 50           | 2 08          | 2 74           | 3 22          | 5 54                             | 7 66          |
| 3 $\frac{1}{4}$ | 1 28          | 1 55           | 2 16          | 2 83           | 3 33          | 5 71                             | 7 89          |
| 3 $\frac{1}{2}$ | 1 32          | 1 60           | 2 24          | 2 92           | 3 44          | 5 88                             | 8 12          |
| 3 $\frac{3}{4}$ | 1 36          | 1 65           | 2 32          | 3 01           | 3 55          | 6 05                             | 8 35          |
| 4               | 1 40          | 1 70           | 2 40          | 3 10           | 3 66          | 6 22                             | 8 58          |
| 4 $\frac{1}{4}$ | 1 44          | 1 75           | 2 48          | 3 19           | 3 77          | 6 39                             | 8 81          |
| 4 $\frac{1}{2}$ | 1 48          | 1 80           | 2 56          | 3 28           | 3 88          | 6 56                             | 9 04          |
| 4 $\frac{3}{4}$ | 1 52          | 1 85           | 2 64          | 3 37           | 3 99          | 6 73                             | 9 27          |
| 5               | 1 56          | 1 90           | 2 72          | 3 46           | 4 10          | 6 90                             | 9 50          |
| 5 $\frac{1}{2}$ | 1 64          | 2 00           | 2 88          | 3 64           | 4 32          | 7 24                             | 9 96          |
| 6               | 1 72          | 2 10           | 3 04          | 3 82           | 4 54          | 7 58                             | 10 42         |
| 6 $\frac{1}{2}$ | 1 80          | 2 20           | 3 20          | 4 00           | 4 76          | 7 92                             | 10 88         |
| 7               | 1 88          | 2 30           | 3 36          | 4 18           | 4 98          | 8 26                             | 11 34         |
| 7 $\frac{1}{2}$ | 1 96          | 2 40           | 3 52          | 4 36           | 5 20          | 8 60                             | 11 80         |
| 8               | 2 04          | 2 50           | 3 68          | 4 54           | 5 42          | 8 94                             | 12 26         |
| 8 $\frac{1}{2}$ | 2 12          | 2 60           | 3 84          | 4 72           | 5 64          | 9 28                             | 12 72         |
| 9               | 2 20          | 2 70           | 4 00          | 4 90           | 5 86          | 9 62                             | 13 18         |
| 9 $\frac{1}{2}$ | 2 28          | 2 80           | 4 16          | 5 08           | 6 08          | 9 96                             | 13 64         |
| 10              | 2 36          | 2 90           | 4 32          | 5 26           | 6 30          | 10 30                            | 14 10         |
| 11              | 2 52          | 3 10           | 4 64          | 5 62           | 6 74          | 10 98                            | 15 02         |
| 12              | 2 68          | 3 30           | 4 96          | 5 98           | 7 18          | 11 66                            | 15 94         |
| 13              | 2 84          | 3 50           | 5 28          | 6 34           | 7 62          | 12 34                            | 16 86         |
| 14              | 3 00          | 3 70           | 5 60          | 6 70           | 8 06          | 13 02                            | 17 78         |
| 15              | 3 16          | 3 90           | 5 92          | 7 06           | 8 50          | 13 70                            | 18 70         |
| 16              | 3 32          | 4 10           | 6 24          | 7 42           | 8 94          | 14 38                            | 19 62         |
| 17              | 3 48          | 4 30           | 6 56          | 7 78           | 9 38          | 15 06                            | 20 54         |
| 18              | 3 64          | 4 50           | 6 88          | 8 14           | 9 82          | 15 74                            | 21 46         |
| 19              | 3 80          | 4 70           | 7 20          | 8 50           | 10 26         | 16 42                            | 22 38         |
| 20              | 3 96          | 4 90           | 7 52          | 8 86           | 10 70         | 17 10                            | 23 30         |

**BOLT ENDS**

With square nuts

| Size of iron,<br>inches             | Length,<br>inches | Price,<br>per lb. | Size of iron,<br>inches | Length,<br>inches | Price,<br>per lb. |
|-------------------------------------|-------------------|-------------------|-------------------------|-------------------|-------------------|
| --                                  | --                | \$--              | 1 $\frac{1}{4}$         | 14                | \$0 11            |
| $\frac{1}{4}$                       | 6                 | 25                | 1 $\frac{3}{8}$         | 15                | 11                |
| $\frac{5}{16}$                      | 6                 | 20                | 1 $\frac{1}{2}$         | 16                | 11                |
| $\frac{3}{8}$                       | 7                 | 18                | 1 $\frac{5}{8}$         | 17                | 12                |
| $\frac{7}{8}$                       | 7                 | 16                | 1 $\frac{3}{4}$         | 18                | 12                |
| 1 $\frac{1}{8}$ and 1 $\frac{3}{8}$ | 8                 | 14                | 1 $\frac{7}{8}$         | 19                | 12                |
| $\frac{5}{8}$                       | 9                 | 12                | 2                       | 20                | 12                |
| $\frac{3}{4}$                       | 10                | 10                | 2 $\frac{1}{4}$         | 22                | 14                |
| $\frac{7}{8}$                       | 11                | 10                | 2 $\frac{1}{2}$         | 24                | 14                |
| 1                                   | 12                | 10                | --                      | --                | --                |
| 1 $\frac{1}{8}$                     | 13                | 10                | --                      | --                | --                |

**DOUBLE END BOLTS**

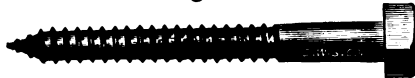
Same list as machine bolts

Fig. 5548

**COACH OR LAG SCREWS**

MANUFACTURERS' LIST

Fig. 5554



With square heads. Adopted Sept. 20, '99, to take effect Oct. 1, '99

**PRICE PER HUNDRED**

| Length in<br>inches | 1 $\frac{5}{8}$ | $\frac{3}{8}$ | 1 $\frac{7}{8}$ | $\frac{1}{2}$ | 1 $\frac{9}{8}$ and $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1     |
|---------------------|-----------------|---------------|-----------------|---------------|-----------------------------------|---------------|---------------|-------|
| 1 $\frac{1}{2}$     | \$2 25          | 2 70          | 3 15            | 3 75          | ----                              | ----          | ----          | ----  |
| 2                   | 2 45            | 2 96          | 3 47            | 4 11          | 5 00                              | ----          | ----          | ----  |
| 2 $\frac{1}{2}$     | 2 65            | 3 22          | 3 79            | 4 47          | 5 50                              | 7 90          | ----          | ----  |
| 3                   | 2 85            | 3 48          | 4 11            | 4 83          | 6 00                              | 8 60          | 12 50         | ----  |
| 3 $\frac{1}{2}$     | 3 05            | 3 74          | 4 43            | 5 19          | 6 50                              | 9 30          | 13 50         | 18 20 |
| 4                   | 3 25            | 4 00          | 4 75            | 5 55          | 7 00                              | 10 00         | 14 50         | 19 50 |
| 4 $\frac{1}{2}$     | 3 45            | 4 26          | 5 07            | 5 91          | 7 50                              | 10 70         | 15 50         | 20 80 |
| 5                   | 3 65            | 4 52          | 5 39            | 6 27          | 8 00                              | 11 40         | 16 50         | 22 10 |
| 5 $\frac{1}{2}$     | 3 85            | 4 78          | 5 71            | 6 63          | 8 50                              | 12 10         | 17 50         | 23 40 |
| 6                   | 4 05            | 5 04          | 6 03            | 6 99          | 9 00                              | 12 80         | 18 50         | 24 70 |
| 6 $\frac{1}{2}$     | ----            | ----          | 6 35            | 7 35          | 9 50                              | 13 50         | 19 50         | 26 00 |
| 7                   | ----            | ----          | 6 67            | 7 71          | 10 00                             | 14 20         | 20 50         | 27 30 |
| 7 $\frac{1}{2}$     | ----            | ----          | 6 99            | 8 07          | 10 50                             | 14 90         | 21 50         | 28 60 |
| 8                   | ----            | ----          | 7 31            | 8 43          | 11 00                             | 15 60         | 22 50         | 29 90 |
| 9                   | ----            | ----          | 7 95            | 9 15          | 12 00                             | 17 00         | 24 50         | 32 50 |
| 10                  | ----            | ----          | ----            | 9 87          | 13 00                             | 18 40         | 26 50         | 35 10 |
| 11                  | ----            | ----          | ----            | 10 59         | 14 00                             | 19 80         | 28 50         | 37 70 |
| 12                  | ----            | ----          | ----            | 11 31         | 15 00                             | 21 20         | 30 50         | 40 30 |

Average weights per 100, page 298

## NUTS, SQUARE AND HEXAGON

## UNITED STATES GOVERNMENT STANDARD SIZE

| U. S. STANDARD SIZES |                |                |                 | Hot pressed, Square,<br>price per pound |        | Hot pressed, Hexagon,<br>price per pound |        | Cold punched, chamfered<br>and trimmed,<br>price per pound |        | Cold punched, chamfered<br>and trimmed,<br>price per pound |        |
|----------------------|----------------|----------------|-----------------|-----------------------------------------|--------|------------------------------------------|--------|------------------------------------------------------------|--------|------------------------------------------------------------|--------|
| Size of<br>Square    | Thick          | Hole           | Size of<br>Bolt | Hot pressed, Square,<br>price per pound |        | Hot pressed, Hexagon,<br>price per pound |        | Cold punched, chamfered<br>and trimmed,<br>price per pound |        | Cold punched, chamfered<br>and trimmed,<br>price per pound |        |
|                      |                |                |                 | Blank                                   | Tapped | Blank                                    | Tapped | Blank                                                      | Tapped | Blank                                                      | Tapped |
| $\frac{1}{4}$        | $\frac{1}{4}$  | $\frac{1}{8}$  | $\frac{1}{4}$   | \$0 13                                  | 15     | 20                                       | 22.5   | 20                                                         | 22     | 27                                                         | 29.5   |
| $\frac{1}{2}$        | $\frac{5}{16}$ | $\frac{1}{4}$  | $\frac{1}{2}$   | 12                                      | 13.5   | 18                                       | 20     | 18                                                         | 19.5   | 24                                                         | 26     |
| $\frac{3}{4}$        | $\frac{3}{8}$  | $\frac{3}{8}$  | $\frac{3}{4}$   | 10.5                                    | 11.6   | 14                                       | 15.6   | 14.5                                                       | 15.6   | 18.5                                                       | 20.1   |
| $\frac{1}{16}$       | $\frac{1}{16}$ | $\frac{1}{16}$ | $\frac{1}{16}$  | 10                                      | 10.9   | 13                                       | 14.3   | 14                                                         | 14.9   | 18                                                         | 19.3   |
| $\frac{1}{8}$        | $\frac{1}{8}$  | $\frac{1}{8}$  | $\frac{1}{8}$   | 9                                       | 9.7    | 11.2                                     | 12.2   | 11.3                                                       | 12     | 14                                                         | 15     |
| $\frac{3}{16}$       | $\frac{9}{16}$ | $\frac{3}{16}$ | $\frac{9}{16}$  | 9                                       | 9.6    | 11.2                                     | 12.1   | 11.3                                                       | 11.9   | 14                                                         | 14.9   |
| $\frac{1}{4}$        | $\frac{1}{4}$  | $\frac{1}{4}$  | $\frac{1}{4}$   | 8.7                                     | 9.2    | 10.5                                     | 11.2   | 10                                                         | 10.5   | 12.5                                                       | 13.2   |
| $\frac{5}{16}$       | $\frac{5}{16}$ | $\frac{5}{16}$ | $\frac{5}{16}$  | 8.5                                     | 8.9    | 10                                       | 10.6   | 9.7                                                        | 10.1   | 11.4                                                       | 12     |
| $\frac{3}{8}$        | $\frac{3}{8}$  | $\frac{3}{8}$  | $\frac{3}{8}$   | 8.4                                     | 8.8    | 9.9                                      | 10.5   | 9.6                                                        | 10     | 11.1                                                       | 11.7   |
| $\frac{1}{2}$        | $\frac{1}{2}$  | $\frac{1}{2}$  | $\frac{1}{2}$   | 8.4                                     | 8.8    | 9.9                                      | 10.5   | 9.6                                                        | 10     | 11.1                                                       | 11.7   |
| $\frac{5}{8}$        | $\frac{5}{8}$  | $\frac{5}{8}$  | $\frac{5}{8}$   | 8.4                                     | 8.8    | 9.9                                      | 10.5   | 9.6                                                        | 10     | 11.1                                                       | 11.7   |
| $\frac{3}{4}$        | $\frac{3}{4}$  | $\frac{3}{4}$  | $\frac{3}{4}$   | 8.4                                     | 8.8    | 9.9                                      | 10.5   | 9.6                                                        | 10     | 11.1                                                       | 11.7   |
| $\frac{7}{8}$        | $\frac{7}{8}$  | $\frac{7}{8}$  | $\frac{7}{8}$   | 8.4                                     | 8.8    | 9.9                                      | 10.5   | 9.6                                                        | 10     | 11.1                                                       | 11.7   |
| $\frac{1}{16}$       | $\frac{1}{16}$ | $\frac{1}{16}$ | $\frac{1}{16}$  | 8.5                                     | 9      | 10                                       | 10.7   | 10.1                                                       | 10.5   | 11.5                                                       | 12.1   |
| $\frac{1}{8}$        | $\frac{1}{8}$  | $\frac{1}{8}$  | $\frac{1}{8}$   | 8.8                                     | 9.4    | 10.3                                     | 11.1   | 10.7                                                       | 11.3   | 12.0                                                       | 12.7   |
| $\frac{3}{16}$       | $\frac{3}{16}$ | $\frac{3}{16}$ | $\frac{3}{16}$  | 9                                       | 9.7    | 10.5                                     | 11.4   | 11.1                                                       | 11.8   | 12.6                                                       | 13.4   |
| $\frac{1}{4}$        | $\frac{1}{4}$  | $\frac{1}{4}$  | $\frac{1}{4}$   | 9.3                                     | 10     | 10.8                                     | 11.7   | 11.5                                                       | 12.2   | 13.2                                                       | 14.1   |
| $\frac{5}{16}$       | $\frac{5}{16}$ | $\frac{5}{16}$ | $\frac{5}{16}$  | 9.5                                     | 10.3   | 11.0                                     | 12     | 12                                                         | 12.8   | 14                                                         | 14.9   |
| $\frac{3}{8}$        | $\frac{3}{8}$  | $\frac{3}{8}$  | $\frac{3}{8}$   | 9.7                                     | 10.6   | 11.2                                     | 12.3   | 12                                                         | 12.9   | 14.5                                                       | 15.5   |
| $\frac{1}{2}$        | $\frac{1}{2}$  | $\frac{1}{2}$  | $\frac{1}{2}$   | 10                                      | 11     | 11.7                                     | 12.9   | 12.5                                                       | 13.5   | 15                                                         | 16.2   |
| $\frac{5}{8}$        | $\frac{5}{8}$  | $\frac{5}{8}$  | $\frac{5}{8}$   | 10                                      | 11.1   | 11.7                                     | 13     | 12.5                                                       | 13.6   | 15                                                         | 16.3   |

For less than keg lots (200 lbs.) of a size, add 20 cents per cwt. for 100 lbs. or over.  
 50 " " " " less than 100 lbs.

# SQUARE NUTS—HOT PRESSED

## MANUFACTURERS' LIST

Fig. 5558



Amended January 17, 1899, to take effect February 1, 1899.

Revised January 1, 1906.

| Short<br>Diameter | Thickness      | Hole            | Size of bolt   | PRICE PER 100 LBS. |        | WEIGHT,<br>PER 1,000 |
|-------------------|----------------|-----------------|----------------|--------------------|--------|----------------------|
|                   |                |                 |                | Blank              | Tapped | Blank,<br>lbs.       |
| $\frac{1}{2}$     | $\frac{1}{4}$  | $\frac{7}{32}$  | $\frac{1}{4}$  | \$13 00            | 15 00  | 13 $\frac{1}{2}$     |
| $\frac{5}{8}$     | $\frac{1}{2}$  | $\frac{9}{32}$  | $\frac{5}{16}$ | 11 50              | 13 00  | 25                   |
| $\frac{3}{4}$     | $\frac{3}{8}$  | $\frac{11}{32}$ | $\frac{3}{8}$  | 10 00              | 11 10  | 46 $\frac{1}{2}$     |
| $\frac{7}{8}$     | $\frac{7}{8}$  | $\frac{25}{64}$ | $\frac{7}{8}$  | 9 20               | 10 10  | 75                   |
| 1                 | $\frac{1}{2}$  | $\frac{1}{2}$   | $\frac{1}{2}$  | 8 70               | 9 40   | 111 $\frac{1}{2}$    |
| $1\frac{1}{8}$    | $\frac{9}{16}$ | $\frac{1}{2}$   | $\frac{9}{16}$ | 8 60               | 9 20   | 146 $\frac{1}{2}$    |
| $1\frac{1}{4}$    | $\frac{5}{8}$  | $\frac{9}{16}$  | $\frac{5}{8}$  | 8 50               | 9 00   | 218                  |
| $1\frac{1}{2}$    | $\frac{3}{4}$  | $\frac{8}{12}$  | $\frac{3}{4}$  | 8 40               | 8 80   | 397                  |
| $1\frac{3}{4}$    | $\frac{7}{8}$  | $\frac{8}{12}$  | $\frac{7}{8}$  | 8 30               | 8 70   | 609                  |
| 2                 | 1              | $\frac{7}{8}$   | 1              | 8 30               | 8 70   | 984                  |
| $2\frac{1}{4}$    | $1\frac{1}{8}$ | $\frac{31}{32}$ | $1\frac{1}{8}$ | 8 30               | 8 70   | 952                  |
| $2\frac{1}{2}$    | $1\frac{1}{4}$ | $1\frac{3}{8}$  | $1\frac{1}{4}$ | 8 30               | 8 70   | 1,886                |
| $2\frac{3}{4}$    | $1\frac{3}{8}$ | $1\frac{3}{8}$  | $1\frac{3}{8}$ | 8 50               | 9 00   | 2,439                |
| 3                 | $1\frac{1}{2}$ | $1\frac{5}{8}$  | $1\frac{1}{2}$ | 8 70               | 9 30   | 3,226                |
| $3\frac{1}{4}$    | $1\frac{5}{8}$ | $1\frac{7}{8}$  | $1\frac{5}{8}$ | 8 90               | 9 60   | 4,166                |
| $3\frac{1}{2}$    | $1\frac{3}{4}$ | $1\frac{7}{8}$  | $1\frac{3}{4}$ | 9 20               | 9 90   | 4,762                |
| $3\frac{3}{4}$    | $1\frac{7}{8}$ | $1\frac{11}{8}$ | $1\frac{7}{8}$ | 9 40               | 10 20  | 5,882                |
| 4                 | 2              | $1\frac{11}{8}$ | 2              | 9 60               | 10 50  | 7,697                |
| 4                 | $2\frac{1}{8}$ | $1\frac{7}{8}$  | $2\frac{1}{8}$ | 9 70               | 10 70  | -----                |
| $4\frac{1}{4}$    | $2\frac{1}{4}$ | 2               | $2\frac{1}{4}$ | 9 90               | 11 00  | -----                |
| $4\frac{1}{2}$    | $2\frac{3}{8}$ | $2\frac{1}{4}$  | $2\frac{3}{8}$ | 10 10              | 11 30  | -----                |
| $4\frac{3}{4}$    | $2\frac{1}{2}$ | $2\frac{1}{4}$  | $2\frac{1}{2}$ | 10 30              | 11 60  | -----                |
| $4\frac{7}{8}$    | $2\frac{3}{4}$ | $2\frac{7}{8}$  | $2\frac{3}{4}$ | 10 80              | 12 20  | -----                |
| 5                 | 3              | $2\frac{11}{8}$ | 3              | 11 30              | 12 80  | -----                |
| $5\frac{1}{2}$    | $3\frac{1}{4}$ | $2\frac{11}{8}$ | $3\frac{1}{4}$ | 12 00              | 13 60  | -----                |
| 6                 | $3\frac{1}{2}$ | $3\frac{1}{8}$  | $3\frac{1}{2}$ | 13 00              | 14 70  | -----                |

For less than keg lots (200 lbs.) of a size, add—

20 cents per cwt. for 100 lbs. or over.

50 cents per cwt. for less than 100 lbs.

In ordering nuts other than U. S. Standard sizes, always give short diameter, thickness and size of hole wanted.



## MANUFACTURER'S LIST

Revised January 1, 1906.

| No. --         | 3  | 4   | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 20   |      |
|----------------|----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Length, inches | 3  | \$0 | 72   | 75   | 78   | 82   | 88   | 94   | ---  | ---  | ---  | ---  | ---  | ---  | ---  | ---  | ---  |      |
|                | 4  | 72  | 75   | 78   | 80   | 84   | 90   | 96   | 1 05 | 1 10 | 1 20 | ---  | ---  | ---  | ---  | ---  | ---  |      |
|                | 5  | 72  | 75   | 78   | 82   | 86   | 92   | 98   | 1 07 | 1 12 | 1 20 | 1 25 | 1 30 | ---  | ---  | ---  | ---  |      |
|                | 6  | 75  | 78   | 82   | 85   | 90   | 95   | 1 00 | 1 10 | 1 15 | 1 25 | 1 35 | 1 50 | 1 65 | 1 80 | ---  | ---  |      |
|                | 7  | 78  | 82   | 85   | 90   | 94   | 1 00 | 1 05 | 1 15 | 1 25 | 1 35 | 1 45 | 1 55 | 1 75 | 2 00 | ---  | ---  |      |
|                | 8  | 80  | 84   | 87   | 92   | 98   | 1 05 | 1 10 | 1 20 | 1 30 | 1 40 | 1 60 | 1 70 | 2 00 | 2 50 | 2 70 | 2 80 | 3 50 |
|                | 9  | 88  | 92   | 98   | 1 05 | 1 10 | 1 15 | 1 20 | 1 30 | 1 40 | 1 55 | 1 70 | 1 90 | 2 15 | 2 50 | 2 75 | 3 30 | 4 00 |
|                | 10 | 98  | 1 05 | 1 10 | 1 15 | 1 20 | 1 30 | 1 35 | 1 40 | 1 50 | 1 65 | 1 80 | 2 00 | 2 35 | 2 80 | 3 03 | 3 80 | 4 30 |
|                | 11 | --- | ---  | 1 30 | 1 35 | 1 45 | 1 50 | 1 55 | 1 60 | 1 70 | 1 80 | 2 00 | 2 52 | 3 02 | 3 50 | 4 03 | 5 04 | 6 00 |
|                | 12 | --- | ---  | 1 45 | 1 50 | 1 55 | 1 60 | 1 65 | 1 75 | 1 85 | 2 00 | 2 20 | 2 45 | 2 75 | 3 10 | 3 70 | 4 20 | 4 80 |
|                | 13 | --- | ---  | 1 55 | 1 60 | 1 65 | 1 75 | 1 85 | 1 95 | 2 05 | 2 20 | 2 35 | 2 65 | 3 10 | 3 50 | 4 50 | 5 55 | 6 30 |
|                | 14 | --- | ---  | 1 90 | 2 00 | 2 10 | 2 20 | 2 30 | 2 40 | 2 50 | 2 60 | 2 70 | 3 00 | 3 30 | 3 65 | 4 20 | 4 70 | 5 80 |
|                | 15 | --- | ---  | ---  | 2 40 | 2 60 | 2 70 | 2 80 | 2 90 | 3 00 | 3 10 | 3 20 | 3 30 | 3 60 | 3 90 | 4 50 | 5 00 | 6 10 |
|                | 16 | --- | ---  | ---  | 2 95 | 3 00 | 3 05 | 3 10 | 3 15 | 3 20 | 3 30 | 3 40 | 3 50 | 3 80 | 4 20 | 4 80 | 5 50 | 6 50 |
|                | 17 | --- | ---  | ---  | ---  | 3 90 | 4 00 | 4 10 | 4 20 | 4 30 | 4 40 | 4 50 | 4 75 | 4 95 | 5 40 | 6 15 | 7 50 | 8 30 |



CAP SCREWS—SQUARE HEAD

Per 100

| Diameter of head -----                |                | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | $\frac{5}{8}$ | $\frac{11}{16}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | $1\frac{1}{8}$ | $1\frac{1}{4}$ | $1\frac{3}{8}$ | $1\frac{1}{2}$ |
|---------------------------------------|----------------|---------------|----------------|---------------|----------------|---------------|-----------------|---------------|---------------|----------------|----------------|----------------|----------------|
| Length of head -----                  |                | $\frac{1}{4}$ | $\frac{5}{16}$ | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$  | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$  | 1              | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
| Diameter of screw -----               |                | $\frac{1}{4}$ | $\frac{5}{16}$ | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$  | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$  | 1              | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
| Length under head to extreme point    | $\frac{3}{4}$  | \$3 00        | 3 25           | 3 75          | 4 50           | 5 70          | -----           | -----         | -----         | -----          | -----          | -----          | -----          |
|                                       | 1              | 3 25          | 3 50           | 4 00          | 4 90           | 5 90          | 9 25            | 9 25          | -----         | -----          | -----          | -----          | -----          |
|                                       | $1\frac{1}{4}$ | 3 50          | 3 75           | 4 25          | 5 30           | 6 50          | 9 50            | 9 50          | 12 50         | -----          | -----          | -----          | -----          |
|                                       | $1\frac{1}{2}$ | 3 75          | 4 00           | 4 50          | 5 70           | 7 10          | 10 00           | 10 00         | 13 50         | 18 40          | -----          | -----          | -----          |
|                                       | $1\frac{3}{4}$ | 4 00          | 4 25           | 4 85          | 6 10           | 7 70          | 10 75           | 10 75         | 14 50         | 19 70          | 22 75          | -----          | -----          |
|                                       | 2              | 4 25          | 4 85           | 5 20          | 6 50           | 8 30          | 11 50           | 11 50         | 15 50         | 21 00          | 25 00          | 34 00          | 38 50          |
|                                       | $2\frac{1}{4}$ | 4 70          | 5 35           | 5 55          | 7 15           | 8 90          | 12 60           | 12 60         | 16 50         | 22 40          | 27 25          | 36 75          | 42 00          |
|                                       | $2\frac{1}{2}$ | 5 25          | 5 80           | 6 00          | 7 50           | 9 50          | 13 60           | 13 60         | 17 50         | 23 70          | 29 50          | 39 50          | 45 50          |
|                                       | $2\frac{3}{4}$ | 5 75          | 6 30           | 6 65          | 7 90           | 10 10         | 14 40           | 14 40         | 19 00         | 25 00          | 31 75          | 42 25          | 49 00          |
|                                       | 3              | 6 25          | 6 80           | 7 20          | 8 40           | 10 70         | 15 20           | 15 20         | 20 60         | 26 40          | 34 00          | 45 00          | 52 50          |
|                                       | $3\frac{1}{4}$ | -----         | -----          | -----         | 9 15           | 11 50         | 16 00           | 16 00         | 22 10         | 28 20          | 36 25          | 47 75          | 56 00          |
|                                       | $3\frac{1}{2}$ | -----         | -----          | -----         | 9 75           | 12 30         | 17 30           | 17 30         | 23 70         | 30 00          | 38 50          | 50 50          | 59 50          |
|                                       | $3\frac{3}{4}$ | -----         | -----          | -----         | 10 50          | 13 10         | 18 60           | 18 60         | 25 30         | 31 80          | 40 75          | 53 25          | 63 00          |
|                                       | 4              | -----         | -----          | -----         | 11 10          | 13 90         | 19 90           | 19 90         | 26 90         | 33 60          | 43 00          | 56 00          | 66 50          |
|                                       | $4\frac{1}{4}$ | -----         | -----          | -----         | -----          | -----         | -----           | 21 20         | 28 50         | 35 40          | 45 25          | 58 75          | 70 00          |
|                                       | $4\frac{1}{2}$ | -----         | -----          | -----         | -----          | -----         | -----           | 22 50         | 30 10         | 37 20          | 47 50          | 61 50          | 73 50          |
|                                       | $4\frac{3}{4}$ | -----         | -----          | -----         | -----          | -----         | -----           | -----         | 31 70         | 39 00          | 49 75          | 64 25          | 77 00          |
|                                       | 5              | -----         | -----          | -----         | -----          | -----         | -----           | -----         | -----         | 40 80          | 52 00          | 67 00          | 80 50          |
| Threads to inch -----                 |                | 20            | 18             | 16            | 14             | 12            | 12              | 11            | 10            | 9              | 8              | 7              | 7              |
| Add for each $\frac{1}{4}$ inch ----- |                | \$0 40        | 50             | 60            | 70             | 80            | 1 30            | 1 30          | 1 60          | 1 80           | 2 25           | 2 75           | 3 50           |

CAP SCREWS—HEXAGON HEAD

Per 100

| Diameter of head -----                |                | $\frac{7}{16}$ | $\frac{1}{2}$  | $\frac{9}{16}$ | $\frac{5}{8}$  | $\frac{3}{4}$ | $1\frac{1}{8}$ | $\frac{7}{8}$ | 1             | $1\frac{1}{8}$ | $1\frac{1}{4}$ | $1\frac{3}{8}$ | $1\frac{1}{2}$ |
|---------------------------------------|----------------|----------------|----------------|----------------|----------------|---------------|----------------|---------------|---------------|----------------|----------------|----------------|----------------|
| Length of head -----                  |                | $\frac{1}{4}$  | $\frac{5}{16}$ | $\frac{3}{8}$  | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$  | 1              | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
| Diameter of screw -----               |                | $\frac{1}{4}$  | $\frac{5}{16}$ | $\frac{3}{8}$  | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$  | 1              | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
| Length under head to extreme point    | $\frac{3}{4}$  | \$3 00         | 3 25           | 3 75           | 4 50           | 5 70          | -----          | -----         | -----         | -----          | -----          | -----          | -----          |
|                                       | 1              | 3 25           | 3 50           | 4 00           | 4 90           | 5 90          | 9 25           | 9 25          | -----         | -----          | -----          | -----          | -----          |
|                                       | $1\frac{1}{4}$ | 3 50           | 3 75           | 4 25           | 5 30           | 6 50          | 9 50           | 9 50          | 12 50         | -----          | -----          | -----          | -----          |
|                                       | $1\frac{1}{2}$ | 3 75           | 4 00           | 4 50           | 5 70           | 7 10          | 10 00          | 10 00         | 13 50         | 18 40          | -----          | -----          | -----          |
|                                       | $1\frac{3}{4}$ | 4 00           | 4 25           | 4 85           | 6 10           | 7 70          | 10 75          | 10 75         | 14 50         | 19 70          | 22 75          | -----          | -----          |
|                                       | 2              | 4 25           | 4 85           | 5 20           | 6 50           | 8 30          | 11 50          | 11 50         | 15 50         | 21 00          | 25 00          | 34 00          | 38 50          |
|                                       | $2\frac{1}{4}$ | 4 70           | 5 35           | 5 55           | 7 15           | 8 90          | 12 60          | 12 60         | 16 50         | 22 40          | 27 25          | 36 75          | 42 00          |
|                                       | $2\frac{1}{2}$ | 5 25           | 5 80           | 6 00           | 7 50           | 9 50          | 13 60          | 13 60         | 17 50         | 23 70          | 29 50          | 39 50          | 45 50          |
|                                       | $2\frac{3}{4}$ | 5 75           | 6 30           | 6 65           | 7 90           | 10 10         | 14 40          | 14 40         | 19 00         | 25 00          | 31 75          | 42 25          | 49 00          |
|                                       | 3              | 6 25           | 6 80           | 7 20           | 8 40           | 10 70         | 15 20          | 15 20         | 20 60         | 26 40          | 34 00          | 45 00          | 52 50          |
|                                       | $3\frac{1}{4}$ | -----          | -----          | -----          | 9 15           | 11 50         | 16 00          | 16 00         | 22 10         | 28 20          | 36 25          | 47 75          | 56 00          |
|                                       | $3\frac{1}{2}$ | -----          | -----          | -----          | 9 75           | 12 30         | 17 30          | 17 30         | 23 70         | 30 00          | 38 50          | 50 50          | 59 50          |
|                                       | $3\frac{3}{4}$ | -----          | -----          | -----          | 10 50          | 13 10         | 18 60          | 18 60         | 25 30         | 31 80          | 40 75          | 53 25          | 63 00          |
|                                       | 4              | -----          | -----          | -----          | 11 10          | 13 90         | 19 90          | 19 90         | 26 90         | 33 60          | 43 00          | 56 00          | 66 50          |
|                                       | $4\frac{1}{4}$ | -----          | -----          | -----          | -----          | -----         | -----          | 21 20         | 28 50         | 35 40          | 45 25          | 58 75          | 70 00          |
|                                       | $4\frac{1}{2}$ | -----          | -----          | -----          | -----          | -----         | -----          | 22 50         | 30 10         | 37 20          | 47 50          | 61 50          | 73 50          |
|                                       | $4\frac{3}{4}$ | -----          | -----          | -----          | -----          | -----         | -----          | -----         | 31 70         | 39 00          | 49 75          | 64 25          | 77 00          |
|                                       | 5              | -----          | -----          | -----          | -----          | -----         | -----          | -----         | -----         | 40 80          | 52 00          | 67 00          | 80 50          |
| Threads to inch -----                 |                | 20             | 18             | 16             | 14             | 12            | 12             | 11            | 10            | 9              | 8              | 7              | 7              |
| Add for each $\frac{1}{4}$ inch ----- |                | \$0 40         | 50             | 60             | 70             | 80            | 1 30           | 1 30          | 1 60          | 1 80           | 2 25           | 2 75           | 3 50           |

Regular cap screws are soft and have ground heads.  
Price of steel cap screws will be 25 per cent above the price of iron.  
Standard V threads.

## ROUGH STUD BOLTS

With U. S. standard chamfered and trimmed hexagon nut on one end.

Price per 100

| Diameter - - - -         |                | $\frac{3}{8}$ | $\frac{7}{8}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1     | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
|--------------------------|----------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|-------|----------------|----------------|
| No. of threads - -       |                | 16            | 14            | 13, 12        | 12             | 11            | 10            | 9             | 8     | 7              | 7              |
| Length over all, inches. | $1\frac{1}{2}$ | \$4 00        | 5 10          | 5 50          | -----          | -----         | -----         | -----         | ----- | -----          | -----          |
|                          | $1\frac{3}{4}$ | 4 10          | 5 25          | 5 65          | -----          | -----         | -----         | -----         | ----- | -----          | -----          |
|                          | 2              | 4 20          | 5 40          | 5 80          | 8 50           | 8 50          | 12 40         | -----         | ----- | -----          | -----          |
|                          | $2\frac{1}{4}$ | 4 30          | 5 55          | 5 95          | 8 75           | 8 75          | 12 70         | -----         | ----- | -----          | -----          |
|                          | $2\frac{1}{2}$ | 4 40          | 5 70          | 6 10          | 9 00           | 9 00          | 13 00         | 18 00         | ----- | -----          | -----          |
|                          | $2\frac{3}{4}$ | 4 50          | 5 85          | 6 25          | 9 25           | 9 25          | 13 30         | 18 50         | ----- | -----          | -----          |
|                          | 3              | 4 60          | 6 00          | 6 40          | 9 50           | 9 50          | 13 60         | 19 00         | 27 80 | -----          | -----          |
|                          | $3\frac{1}{4}$ | 4 70          | 6 15          | 6 55          | 9 75           | 9 75          | 13 90         | 19 50         | 28 40 | -----          | -----          |
|                          | $3\frac{1}{2}$ | 4 80          | 6 30          | 6 70          | 10 00          | 10 00         | 14 20         | 20 00         | 29 00 | 41 50          | -----          |
|                          | $3\frac{3}{4}$ | 4 90          | 6 45          | 6 85          | 10 25          | 10 25         | 14 50         | 20 50         | 29 60 | 42 25          | -----          |
|                          | 4              | 5 00          | 6 60          | 7 00          | 10 50          | 10 50         | 14 80         | 21 00         | 30 20 | 43 00          | 60 00          |
|                          | $4\frac{1}{4}$ | 5 25          | 6 90          | 7 30          | 11 00          | 11 00         | 15 40         | 22 00         | 31 40 | 44 50          | 62 50          |
|                          | 5              | 6 00          | 7 60          | 7 60          | 11 50          | 11 50         | 16 00         | 23 00         | 32 60 | 46 00          | 65 00          |
|                          | $5\frac{1}{2}$ | 7 25          | 8 00          | 8 00          | 12 00          | 12 00         | 16 20         | 24 00         | 33 80 | 47 50          | 67 50          |
|                          | 6              | 8 00          | 8 45          | 8 45          | 12 50          | 12 50         | 17 60         | 25 00         | 35 00 | 49 00          | 70 00          |
|                          | 7              | -----         | -----         | -----         | 13 60          | 13 60         | 18 60         | 27 00         | 37 50 | 52 00          | 75 50          |
|                          | 8              | -----         | -----         | -----         | 14 80          | 14 80         | 20 10         | 29 10         | 40 10 | 56 00          | 81 00          |
|                          | 9              | -----         | -----         | -----         | -----          | -----         | 21 60         | 31 20         | 42 80 | 60 50          | 86 00          |
|                          | 10             | -----         | -----         | -----         | -----          | -----         | 23 20         | 33 40         | 45 50 | 65 00          | 92 00          |

## IRON SET SCREWS—MILLED—SQUARE HEAD

Per 100

| Diameter of screw - inches            |                | $\frac{1}{4}$ | $\frac{5}{16}$ | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1     | $1\frac{1}{8}$ | $1\frac{1}{4}$ |
|---------------------------------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|---------------|---------------|-------|----------------|----------------|
| Length under head to extreme point.   | $\frac{3}{4}$  | \$2 00        | 2 20           | 2 50          | 2 90           | 3 40          | 5 00           | 5 00          | -----         | -----         | ----- | -----          | -----          |
|                                       | 1              | 2 15          | 2 35           | 2 65          | 3 10           | 3 80          | 5 75           | 5 75          | 10 00         | -----         | ----- | -----          | -----          |
|                                       | $1\frac{1}{4}$ | 2 30          | 2 50           | 2 85          | 3 50           | 4 30          | 6 50           | 6 50          | 11 00         | 15 50         | ----- | -----          | -----          |
|                                       | $1\frac{1}{2}$ | 2 50          | 2 70           | 3 10          | 4 00           | 4 80          | 7 25           | 7 25          | 12 00         | 16 20         | 22 00 | -----          | -----          |
|                                       | $1\frac{3}{4}$ | 2 75          | 3 00           | 3 50          | 4 50           | 5 40          | 8 00           | 8 00          | 12 80         | 17 70         | 24 00 | 41 70          | -----          |
|                                       | 2              | 3 25          | 3 50           | 4 00          | 5 15           | 6 00          | 8 80           | 8 80          | 13 60         | 19 20         | 26 00 | 45 00          | 54 00          |
|                                       | $2\frac{1}{4}$ | 3 75          | 4 00           | 4 50          | 5 75           | 6 75          | 9 60           | 9 60          | 14 50         | 20 70         | 28 00 | 48 30          | 58 30          |
|                                       | $2\frac{1}{2}$ | 4 25          | 4 50           | 5 00          | 6 35           | 7 50          | 10 40          | 10 40         | 15 40         | 22 20         | 30 00 | 51 60          | 62 60          |
|                                       | $2\frac{3}{4}$ | 4 75          | 5 00           | 5 50          | 6 75           | 8 25          | 11 20          | 11 20         | 16 30         | 23 70         | 32 00 | 54 90          | 66 90          |
|                                       | 3              | 5 25          | 5 50           | 6 00          | 7 20           | 9 00          | 12 00          | 12 00         | 17 30         | 25 20         | 34 00 | 58 20          | 71 20          |
|                                       | $3\frac{1}{4}$ | -----         | -----          | -----         | 7 60           | 9 75          | 12 75          | 12 75         | 18 40         | 26 70         | 36 00 | 61 50          | 75 50          |
|                                       | $3\frac{1}{2}$ | -----         | -----          | -----         | 8 00           | 10 50         | 13 50          | 13 50         | 19 50         | 28 20         | 38 00 | 64 80          | 79 80          |
|                                       | $3\frac{3}{4}$ | -----         | -----          | -----         | 8 50           | 11 25         | 14 30          | 14 30         | 20 75         | 29 70         | 40 00 | 68 10          | 84 10          |
|                                       | 4              | -----         | -----          | -----         | 9 00           | 12 00         | 15 10          | 15 10         | 22 00         | 31 20         | 42 00 | 71 40          | 88 40          |
|                                       | $4\frac{1}{4}$ | -----         | -----          | -----         | -----          | -----         | 15 90          | 15 90         | 23 50         | 32 70         | 44 00 | 74 70          | 92 70          |
|                                       | $4\frac{1}{2}$ | -----         | -----          | -----         | -----          | -----         | 16 70          | 16 70         | 25 00         | 34 20         | 46 00 | 78 00          | 97 00          |
|                                       | $4\frac{3}{4}$ | -----         | -----          | -----         | -----          | -----         | -----          | -----         | 26 50         | 35 70         | 48 00 | 81 30          | 101 30         |
|                                       | 5              | -----         | -----          | -----         | -----          | -----         | -----          | -----         | -----         | 37 20         | 50 00 | 84 60          | 105 60         |
| Threads to inch - - - -               |                | 20            | 18             | 16            | 14             | 12            | 12             | 11            | 10            | 9             | 8     | 7              | 7              |
| Add for each $\frac{1}{4}$ inch - - - |                | \$0 50        | 60             | 70            | 80             | 90            | 1 10           | 1 10          | 1 50          | 1 70          | 2 25  | 3 30           | 4 30           |

Regular set screws are case hardened, have cup points, and the heads are same diameter as the body. Orders will be filled with these unless otherwise specified. All orders filled with V threads unless otherwise specified.

IRON RIVETS

SUCKER ROD—Fig. 5889



TANK—Fig. 5890



BAILER—Fig. 5891



By the keg, per lb. \$0.15½  
Less than keg, per lb. .19½

By the keg, per lb. \$0.16  
Less than keg, per lb. .20

By the keg, per lb. \$0.15  
Less than keg, per lb. .19

RIVETS NOT ILLUSTRATED

Copper - - - per lb. \$0 50

Boiler, Burden's - per lb. 05

Boiler, Dover - per lb. 05

CUT NAILS

NATIONAL CARD OF EXTRAS

Adopted at New York, December 1, 1896. Use same card for steel wire nails.

COMMON FENCE, SHINGLE, TOBACCO,  
FLOORING AND COMMON BRADS

|             | Advances         |
|-------------|------------------|
| 20d and 60d | - - - - - Base   |
| 10d and 16d | - - - - - \$0 05 |
| 8d and 9d   | - - - - - 10     |
| 6d and 7d   | - - - - - 20     |
| 4d and 5d   | - - - - - 30     |
| 3d          | - - - - - 45     |
| 2d          | - - - - - 70     |

BARBED COMMON AND BARBED CAR  
NAILS

15 per cent advance over common.

CASING AND SMOOTH BOX

|                |                |
|----------------|----------------|
| 10d and larger | - - - - - 15   |
| 8d and 9d      | - - - - - 25   |
| 6d and 7d      | - - - - - 35   |
| 4d and 5d      | - - - - - 50   |
| 3d             | - - - - - 70   |
| 2d             | - - - - - 1 00 |

Barbed box 15 cents advance over  
smooth nails.

SMOOTH FINISHING NAILS

|                |                |
|----------------|----------------|
| 10d and larger | - - - - - 25   |
| 8d and 9d      | - - - - - 35   |
| 6d and 7d      | - - - - - 45   |
| 4d and 5d      | - - - - - 65   |
| 3d             | - - - - - 85   |
| 2d             | - - - - - 1 15 |

LINING NAILS

|        |                |
|--------|----------------|
| ¾ inch | - - - - - 1 20 |
| ⅞ inch | - - - - - 1 00 |
| 1 inch | - - - - - 80   |

SLATING NAILS

|    |              |
|----|--------------|
| 2d | - - - - - 80 |
| 3d | - - - - - 60 |
| 4d | - - - - - 40 |
| 5d | - - - - - 40 |
| 6d | - - - - - 30 |

FINE NAILS

|                         | Advance          |
|-------------------------|------------------|
| 2d                      | - - - - - \$1 00 |
| 3d, 1½ x 15             | - - - - - 50     |
| 3d, extra fine, 1½ x 16 | - - - - - 65     |

BARREL

|         |                |
|---------|----------------|
| ¾ inch  | - - - - - 1 00 |
| ⅞ inch  | - - - - - 65   |
| 1 inch  | - - - - - 60   |
| 1½ inch | - - - - - 60   |
| 1¼ inch | - - - - - 50   |
| 1⅜ inch | - - - - - 40   |
| 1½ inch | - - - - - 30   |

BARBED ROOFING

|                |              |
|----------------|--------------|
| ¾ inch         | - - - - - 75 |
| ⅞ inch         | - - - - - 65 |
| 1 inch         | - - - - - 60 |
| 1½ inch        | - - - - - 60 |
| 1¼ inch        | - - - - - 55 |
| 1½ and 1¾ inch | - - - - - 45 |
| 2 inch         | - - - - - 35 |

CLINCH NAILS

|            |                |
|------------|----------------|
| 2d         | - - - - - 1 05 |
| 3d         | - - - - - 85   |
| 4d and 5d  | - - - - - 65   |
| 6d and 7d  | - - - - - 55   |
| 8d and 9d  | - - - - - 45   |
| 10d to 20d | - - - - - 35   |

HINGE NAILS

|                |              |
|----------------|--------------|
| 4d             | - - - - - 80 |
| 6d             | - - - - - 70 |
| 8d             | - - - - - 60 |
| 10d and larger | - - - - - 50 |

SPIKES

|           |              |
|-----------|--------------|
| All sizes | - - - - - 10 |
|-----------|--------------|

BARBED DOWEL PINS

|        |            |         |          |
|--------|------------|---------|----------|
| ⅝ inch | - - \$2 00 | 1½ inch | - - 1 15 |
| ¾ inch | - - 1 75   | 1¾ inch | - - 1 00 |
| ⅞ inch | - - 1 50   | 1⅝ inch | - - 1 00 |
| 1 inch | - - 1 25   | 1½ inch | - - 1 00 |

LENGTH OF NAILS

|        |              |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |
|--------|--------------|----|---|----|----|----|---|----|----|----|----|----|----|----|----|----|----|----|
| Size   | - - - - -    | 1d | 2 | 3  | 4  | 5  | 6 | 7  | 8  | 9  | 10 | 12 | 16 | 20 | 30 | 40 | 50 | 60 |
| Length | - - - inches | ¾  | 1 | 1¼ | 1½ | 1¾ | 2 | 2¼ | 2½ | 2¾ | 3  | 3¼ | 3½ | 4  | 4½ | 5  | 5½ | 6  |

## WOOD CASE PULLEY BLOCKS

Fig. 5289



Single

Fig. 5290



Double

Fig. 5291



Triple

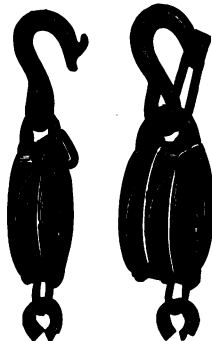
| DIMENSIONS,<br>INCHES |               |               | IRON BUSHED |                 |        |                 |        |                 | IMPROVED<br>ROLLER BUSHED |        |        | NET EXTRA FOR<br>GALVANIZED STRAPS |        |        |
|-----------------------|---------------|---------------|-------------|-----------------|--------|-----------------|--------|-----------------|---------------------------|--------|--------|------------------------------------|--------|--------|
| Size sheave           | Diam.<br>rope | Size<br>shell | Single      | Weight,<br>lbs. | Double | Weight,<br>lbs. | Triple | Weight,<br>lbs. | Single                    | Double | Triple | Single                             | Double | Triple |
| 1 1/2 x 1 1/2 x 1 1/2 | 3/4           | 3             | \$0 70      | .75             | \$1 30 | 1.5             | \$1 75 | 2               | \$1 10                    | 2 00   | 2 90   | 04                                 | 06     | 10     |
| 2 x 2 x 2             | 3/4           | 3 1/2         | 75          | 1               | 1 45   | 1.8             | 2 00   | 2.5             | 1 15                      | 2 20   | 3 15   | 04                                 | 06     | 10     |
| 2 1/2 x 2 1/2 x 2 1/2 | 1             | 4             | 85          | 1.5             | 1 60   | 2.3             | 2 15   | 3.5             | 1 20                      | 2 25   | 3 25   | 05                                 | 07     | 11     |
| 3 x 3 x 3             | 1 1/4         | 5             | 90          | 2.5             | 1 75   | 4.3             | 2 25   | 6               | 1 25                      | 2 35   | 3 50   | 06                                 | 08     | 12     |
| 3 1/2 x 1 x 1         | 1 1/4         | 6             | 1 10        | 4.3             | 2 00   | 7               | 2 90   | 10.5            | 1 50                      | 2 85   | 4 40   | 10                                 | 12     | 15     |
| 4 1/2 x 1 x 1         | 1 1/4         | 7             | 1 30        | 6               | 2 40   | 8.5             | 3 50   | 13.5            | 1 70                      | 3 35   | 5 00   | 12                                 | 15     | 18     |
| 4 1/2 x 1 1/2 x 1 1/2 | 1 1/2         | 8             | 1 65        | 9               | 2 85   | 13              | 4 25   | 19              | 2 25                      | 4 15   | 6 00   | 16                                 | 21     | 30     |
| 5 1/2 x 1 1/2 x 1 1/2 | 1 1/2         | 9             | 1 85        | 12              | 3 40   | 17              | 4 75   | 25              | 2 50                      | 4 70   | 7 25   | 22                                 | 28     | 38     |
| 6 1/2 x 1 1/2 x 1 1/2 | 1 1/2         | 10            | 2 75        | 15.5            | 4 50   | 23.5            | 6 25   | 33              | 3 50                      | 6 00   | 8 50   | 28                                 | 38     | 50     |
| 7 1/2 x 1 1/2 x 1 1/2 | 1 1/2         | 11            | 4 45        | 19              | 7 50   | 26              | 10 65  | 41              | 5 30                      | 9 20   | 13 20  | 35                                 | 45     | 60     |
| 8 x 1 1/2 x 1 1/2     | 1 1/2         | 12            | 4 45        | 24              | 7 50   | 36              | 10 65  | 48              | 5 30                      | 9 20   | 13 20  | 35                                 | 45     | 60     |
| 9 x 1 1/2 x 1 1/2     | 1 1/2         | 13            | 7 00        | 30              | 10 50  | 43              | 15 00  | 60              | 8 15                      | 12 80  | 18 45  | 55                                 | 75     | 1 00   |
| 9 1/2 x 1 1/2 x 1 1/2 | 1 1/2         | 14            | 7 00        | 38              | 10 50  | 58              | 15 00  | 80              | 8 15                      | 12 80  | 18 45  | 55                                 | 75     | 1 00   |
| 10 x 1 1/2 x 1 1/2    | 1 1/2         | 15            | 8 00        | 40              | 13 00  | 62              | 18 00  | 84              | 9 25                      | 15 50  | 21 75  | 75                                 | 95     | 1 25   |
| 11 x 1 1/2 x 1 1/2    | 1 1/2         | 16            | 10 00       | 54              | 15 00  | 77              | 22 00  | 115             | 11 50                     | 18 00  | 26 50  | 85                                 | 1 20   | 1 50   |

## STEEL PULLEY BLOCKS

THE "HARTZ" PATENT

Fig. 5312

Fig. 5313



| Size of<br>rope,<br>inches | Length<br>of shell,<br>inches | Single | Weight,<br>lbs. | Double | Weight,<br>lbs. | Triple | Weight,<br>lbs. |
|----------------------------|-------------------------------|--------|-----------------|--------|-----------------|--------|-----------------|
| 1/2                        | 4                             | \$0 85 | 2               | \$1 60 | 3               | 2 15   | 5               |
| 3/4                        | 5                             | 90     | 3               | 1 75   | 5               | 2 25   | 7               |
| 1                          | 6                             | 1 10   | 4               | 2 00   | 8               | 2 90   | 10              |
| 1 1/4                      | 7                             | 1 30   | 7               | 2 40   | 12              | 3 50   | 15              |
| 1 1/2                      | 8                             | 1 65   | 10              | 2 85   | 17              | 4 25   | 20              |
| 1 3/4                      | 9                             | 1 85   | 12              | 3 40   | 20              | 4 75   | 27              |
| 2                          | 10                            | 2 75   | 17              | 4 50   | 27              | 6 25   | 33              |
| 2 1/4                      | 12                            | 4 45   | 25              | 7 50   | 38              | 10 65  | 49              |
| 2 1/2                      | 14                            | 7 00   | 33              | 10 50  | 52              | 15 00  | 65              |

Fig. 5314



WROUGHT IRON PULLEY BLOCKS

Fig. 5303



Single

Fig. 5304



Double

Fig. 5305



Triple

| DIMENSIONS, INCHES |               |              |               | IRON BUSHED |                 |        |                 |        |                 | PHOSPHOR BRONZE<br>OR<br>METALINE BUSHED,<br>SELF-LUBRICATING |        |        |
|--------------------|---------------|--------------|---------------|-------------|-----------------|--------|-----------------|--------|-----------------|---------------------------------------------------------------|--------|--------|
| Size<br>sheave     | Diam.<br>rope | For<br>chain | Size<br>shell | Single      | Weight,<br>lbs. | Double | Weight,<br>lbs. | Triple | Weight,<br>lbs. | Single                                                        | Double | Triple |
| 3½x1               | ¾             | --           | 6             | \$2 35      | 4.5             | 3 75   | 7.5             | 4 60   | 9.5             | 3 35                                                          | 5 75   | 7 60   |
| 4¼x1               | ⅞             | --           | 7             | 3 10        | 6.5             | 4 60   | 10              | 5 85   | 13.5            | 4 35                                                          | 7 10   | 9 60   |
| 4½x1⅛              | 1             | --           | 8             | 4 00        | 8.5             | 5 85   | 13.5            | 7 50   | 19              | 5 25                                                          | 8 35   | 11 25  |
| 5 x1⅝              | 1⅛            | ½            | 9             | 5 35        | 12.5            | 8 20   | 17              | 10 50  | 25              | 6 85                                                          | 11 20  | 15 00  |
| 6 x1½              | 1¼            | ⅝            | 10            | 6 20        | 17.5            | 10 50  | 30              | 13 50  | 38              | 7 85                                                          | 13 80  | 18 50  |
| 7 x1⅝              | 1½            | ¾            | 12            | 7 60        | 25              | 13 50  | 43              | 17 25  | 58              | 9 45                                                          | 17 20  | 22 80  |
| 8 x1⅞              | 1¾            | ⅞            | 14            | 10 50       | 40              | 20 00  | 65              | 27 00  | 90              | 12 60                                                         | 24 20  | 33 30  |
| 9 x2¼              | 2             | 1            | 16            | 16 70       | 60              | 27 50  | 97              | 38 50  | 130             | 19 20                                                         | 32 50  | 46 00  |
| 10 x2⅜             | 2¼            | 1⅝           | 18            | 28 50       | 78              | 43 00  | 133             | 58 50  | 182             | 31 75                                                         | 49 50  | 68 25  |
| 11 x2⅝             | 2½            | 1⅞           | 20            | 38 60       | 121             | 58 50  | 189             | 86 00  | 275             | 42 00                                                         | 65 30  | 96 20  |

For list on quadruple blocks, add the list for single and triple together.

Fig. 5315



Fig. 5316



STEEL AUTOMATIC LOCK SNATCH  
BLOCKS

| Length of<br>strap, inches | Size of sheave,<br>inches | Diameter of rope,<br>inches | Weight,<br>lbs. | With plain<br>bushings | Self-lubricating<br>graphite bronze<br>bushings |
|----------------------------|---------------------------|-----------------------------|-----------------|------------------------|-------------------------------------------------|
| 7                          | 3½ x 1¼                   | ¾, ⅞                        | 6               | \$4 75                 | \$5 50                                          |
| 8                          | 4 x 1½                    | 1, 1⅛                       | 10              | 5 75                   | 7 00                                            |
| 10                         | 5½ x 1⅝                   | 1¼, 1½                      | 17              | 8 50                   | 10 00                                           |
| 12                         | 7 x 2                     | 1½, 1⅞                      | 27              | 10 00                  | 11 50                                           |
| 14                         | 8 x 2¼                    | 1¾, 1⅞                      | 42              | 13 00                  | 15 00                                           |
| 16                         | 9 x 2½                    | 2, 2¼                       | 53              | 17 00                  | 20 00                                           |

# MALLEABLE IRON PULLEY BLOCKS

WITH LOOSE HOOKS

Fig. 5300



Fig. 5301



Fig. 5302



| Size of rope,<br>inches | Length of shell,<br>inches | FIG. 5300 |                 | FIG. 5301 |                 | FIG. 5302 |                 |
|-------------------------|----------------------------|-----------|-----------------|-----------|-----------------|-----------|-----------------|
|                         |                            | Single    | Weight,<br>lbs. | Double    | Weight,<br>lbs. | Triple    | Weight,<br>lbs. |
| $\frac{1}{2}$           | 4                          | \$0 90    | 1.7             | \$1 75    | 2.5             | \$2 50    | 3.7             |
| $\frac{3}{8}$           | 5                          | 1 00      | 3               | 1 90      | 4               | 2 75      | 5.5             |
| $\frac{1}{2}$           | 6                          | 1 25      | 4.5             | 2 25      | 6               | 3 25      | 7.5             |
| $\frac{3}{4}$           | 7                          | 1 50      | 6.5             | 2 70      | 9.5             | 4 00      | 13.5            |
| $\frac{1}{2}$           | 8                          | 1 85      | 9.3             | 3 20      | 14              | 4 75      | 20              |
| 1                       | 9                          | 2 40      | 12              | 4 00      | 17.5            | 5 50      | 24              |
| $1\frac{1}{8}$          | 10                         | 3 10      | 16              | 5 10      | 26              | 7 00      | 32              |
| $1\frac{1}{2}$          | 12                         | 5 00      | 24              | 8 25      | 32              | 11 75     | 50              |
| $1\frac{3}{4}$          | 14                         | 7 50      | 33              | 11 75     | 48              | 16 50     | 68              |

# MALLEABLE IRON LOCK SNATCH BLOCKS

Fig. 5320



Fig. 5321



| DIMENSIONS, INCHES |                                    |                                  | Plain bushed,<br>price | Self-lubricating<br>phos. bronze<br>bushed, price | Ball bearing,<br>price | Weight,<br>lbs. |
|--------------------|------------------------------------|----------------------------------|------------------------|---------------------------------------------------|------------------------|-----------------|
| Length of<br>shell | Size of sheave                     | Diameter of<br>rope              |                        |                                                   |                        |                 |
| 7                  | $3\frac{1}{2} \times 1\frac{1}{4}$ | $\frac{3}{4}$ to $\frac{7}{8}$   | \$4 75                 | 5 50                                              | 5 50                   | 7               |
| 8                  | $4 \times 1\frac{1}{2}$            | 1 to $1\frac{1}{8}$              | 5 75                   | 7 00                                              | 7 00                   | 11              |
| 10                 | $5\frac{1}{2} \times 1\frac{3}{8}$ | $1\frac{1}{4}$ to $1\frac{3}{8}$ | 8 50                   | 10 00                                             | 10 00                  | 18              |
| 12                 | $7 \times 2$                       | $1\frac{1}{2}$ to $1\frac{3}{4}$ | 10 00                  | 11 50                                             | 11 50                  | 27              |
| 14                 | $8 \times 2\frac{1}{4}$            | $1\frac{3}{4}$ to $1\frac{7}{8}$ | 13 00                  | 15 00                                             | 15 00                  | 40              |
| 16                 | $9 \times 2\frac{1}{2}$            | 2 to $2\frac{1}{4}$              | 17 00                  | 20 00                                             | 20 00                  | 53              |

## WOOD SNATCH BLOCK WITH DROP LINK.

IRON STRAPPED.



Fig. 5293.

| Size of Sheave<br>Inches                             | For Diam-<br>eter Rope<br>Inches | Length of<br>Shell<br>Inches | Weight<br>lbs.   | Common<br>Iron Bushed<br>Each | Patent Roll-<br>er, Bushed<br>Each | Self-lubri-<br>cating Met-<br>aline or<br>Bronze<br>Bushed<br>Each |
|------------------------------------------------------|----------------------------------|------------------------------|------------------|-------------------------------|------------------------------------|--------------------------------------------------------------------|
| 3 x 1 $\frac{1}{8}$ x $\frac{1}{2}$                  | $\frac{7}{8}$                    | 6                            | 6                | \$4 00                        | \$4 65                             | \$5 25                                                             |
| 3 $\frac{1}{2}$ x 1 $\frac{1}{2}$ x $\frac{1}{2}$    | $\frac{7}{8}$                    | 7                            | 8 $\frac{1}{2}$  | 4 75                          | 5 50                               | 6 00                                                               |
| 4 $\frac{1}{2}$ x 1 $\frac{1}{2}$ x $\frac{5}{8}$    | 1                                | 8                            | 12               | 5 75                          | 6 60                               | 7 25                                                               |
| 5 x 1 $\frac{1}{2}$ x $\frac{5}{8}$                  | 1 $\frac{1}{8}$                  | 9                            | 15               | 6 75                          | 7 75                               | 8 50                                                               |
| 5 $\frac{1}{2}$ x 1 $\frac{7}{8}$ x $\frac{3}{4}$    | 1 $\frac{1}{4}$                  | 10                           | 21 $\frac{1}{2}$ | 8 50                          | 10 00                              | 11 00                                                              |
| 6 $\frac{1}{2}$ x 2 $\frac{1}{2}$ x $\frac{3}{4}$    | 1 $\frac{1}{2}$                  | 12                           | 31               | 10 00                         | 11 50                              | 13 00                                                              |
| 8 x 2 $\frac{1}{2}$ x $\frac{7}{8}$                  | 1 $\frac{3}{4}$                  | 14                           | 44               | 13 00                         | 15 00                              | 16 50                                                              |
| 9 x 2 $\frac{3}{8}$ x 1                              | 2                                | 16                           | 83               | 17 00                         | 20 00                              | 22 00                                                              |
| 10 x 3 x 1                                           | 2 $\frac{1}{2}$                  | 18                           | 89               | 25 00                         | 28 50                              | 31 00                                                              |
| 11 x 3 $\frac{1}{2}$ x 1 $\frac{1}{2}$               | 2 $\frac{1}{2}$                  | 20                           | 128              | 38 00                         | 43 00                              | 46 00                                                              |
| 11 $\frac{1}{2}$ x 4 $\frac{1}{2}$ x 1 $\frac{1}{2}$ | 3                                | 22                           | 174              | 55 00                         | 63 00                              | 68 00                                                              |
| 12 $\frac{1}{2}$ x 4 $\frac{1}{2}$ x 1 $\frac{1}{2}$ | 3 $\frac{1}{2}$                  | 24                           | 230              | 70 00                         | 78 00                              | 86 00                                                              |
| 14 x 4 $\frac{1}{2}$ x 1 $\frac{1}{2}$               | 4                                | 26                           | .....            | 90 00                         | .....                              | 110 00                                                             |

## “HARTZ” DERRICK AND HOISTING BLOCKS FOR WIRE ROPE

Fig. 5317



Fig. 5318



| Length of<br>shell, inches | Size of sheave,<br>inches | Diameter of<br>rope, inches | Single | Weight,<br>lbs. | Double  | Weight,<br>lbs. | Triple  | Weight,<br>lbs. |
|----------------------------|---------------------------|-----------------------------|--------|-----------------|---------|-----------------|---------|-----------------|
| 12                         | 9½ x 1½ x ¾               | ¾ or ½                      | \$6 50 | 28              | \$12 00 | 43              | \$18 00 | 56              |
| 13                         | 10½ x 1½ x ¾              | ¾ or ¾                      | 8 00   | 36              | 15 00   | 56              | 22 00   | 75              |
| 16                         | 12 x 2 x 1                | ¾ or ¾                      | 10 00  | 53              | 19 00   | 86              | 27 00   | 125             |
| 18                         | 14 x 2½ x 1               | ¾ or 1                      | 15 00  | 74              | 24 00   | 120             | 36 00   | 170             |

## SURE GRIP STEEL TACKLE BLOCKS

Fig. 5325



Representing  
Nos. 3, 4, 5, and 6

Fig. 5326



Representing  
Nos. 4½, 5½,  
and 6½

| No. | Size rope to<br>use,<br>inches | One man can<br>lift, lbs. | Capacity,<br>lbs. | Price  |
|-----|--------------------------------|---------------------------|-------------------|--------|
| 3   | ¾                              | 300                       | 600               | \$3 00 |
| 4   | ¾                              | 350                       | 1,000             | 5 50   |
| 5   | ¾                              | 400                       | 1,800             | 7 00   |
| 6   | ¾                              | 450                       | 2,500             | 8 50   |
| 4½  | ¾                              | 600                       | 3,000             | 10 00  |
| 5½  | ¾                              | 700                       | 3,500             | 12 00  |
| 6½  | ¾                              | 850                       | 5,000             | 14 00  |



## JACK SCREWS

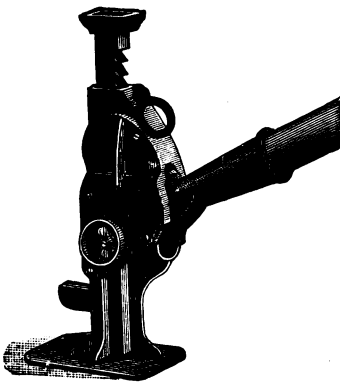
Figs.  
1932-1933

| Diameter of screw, inches | Height of stand, inches | Lifting capacity, tons | Weight, pounds | Price  | Diameter of screw, inches | Height of stand, inches | Lifting capacity, tons | Weight, pounds | Price   |
|---------------------------|-------------------------|------------------------|----------------|--------|---------------------------|-------------------------|------------------------|----------------|---------|
| 1 1/8                     | 6                       | 8                      | --             | \$2 90 | 2                         | 20                      | 20                     | 47             | \$11 50 |
| 1 1/8                     | 8                       | 8                      | --             | 3 25   | 2                         | 22                      | 20                     | 49             | 12 50   |
| 1 1/8                     | 10                      | 8                      | --             | 3 60   | 2                         | 24                      | 20                     | 58             | 13 50   |
| 1 1/8                     | 12                      | 8                      | --             | 4 00   | 2 1/4                     | 8                       | 24                     | 26             | 7 50    |
| 1 1/8                     | 14                      | 8                      | --             | 4 40   | 2 1/4                     | 10                      | 24                     | 29             | 8 25    |
| 1 1/4                     | 6                       | 10                     | 9              | 3 10   | 2 1/4                     | 12                      | 24                     | 34             | 9 00    |
| 1 1/4                     | 8                       | 10                     | 11             | 3 40   | 2 1/4                     | 14                      | 24                     | 37             | 10 00   |
| 1 1/4                     | 10                      | 10                     | 13             | 3 80   | 2 1/4                     | 16                      | 24                     | 41             | 11 00   |
| 1 1/4                     | 12                      | 10                     | 16             | 4 20   | 2 1/4                     | 18                      | 24                     | 43             | 12 00   |
| 1 1/4                     | 14                      | 10                     | 17             | 4 60   | 2 1/4                     | 20                      | 24                     | 52             | 13 25   |
| 1 1/2                     | 5                       | 12                     | 10             | 3 50   | 2 1/2                     | 22                      | 24                     | 57             | 14 50   |
| 1 1/2                     | 6                       | 12                     | 12             | 3 75   | 2 1/2                     | 24                      | 24                     | 66             | 15 75   |
| 1 1/2                     | 8                       | 12                     | 14             | 4 25   | 2 1/2                     | 6                       | 28                     | 24             | 7 75    |
| 1 1/2                     | 10                      | 12                     | 16             | 4 75   | 2 1/2                     | 6 1/2                   | 28                     | 25             | 8 00    |
| 1 1/2                     | 12                      | 12                     | 19             | 5 25   | 2 1/2                     | 8                       | 28                     | 30             | 8 75    |
| 1 1/2                     | 14                      | 12                     | 22             | 6 00   | 2 1/2                     | 10                      | 28                     | 33             | 9 75    |
| 1 1/2                     | 16                      | 12                     | 24             | 6 75   | 2 1/2                     | 12                      | 28                     | 38             | 10 75   |
| 1 3/4                     | 6                       | 16                     | 14             | 4 50   | 2 1/2                     | 14                      | 28                     | 43             | 12 00   |
| 1 3/4                     | 8                       | 16                     | 17             | 5 00   | 2 1/2                     | 16                      | 28                     | 47             | 13 25   |
| 1 3/4                     | 10                      | 16                     | 21             | 5 75   | 2 1/2                     | 18                      | 28                     | 55             | 14 50   |
| 1 3/4                     | 12                      | 16                     | 25             | 6 25   | 2 1/2                     | 20                      | 28                     | 60             | 15 75   |
| 1 3/4                     | 14                      | 16                     | 30             | 6 75   | 2 1/2                     | 22                      | 28                     | 64             | 17 00   |
| 1 3/4                     | 16                      | 16                     | 31             | 7 50   | 2 1/2                     | 24                      | 28                     | 74             | 18 25   |
| 1 3/4                     | 18                      | 16                     | 33             | 8 50   | 2 1/2                     | 28                      | 28                     | 83             | 22 00   |
| 2                         | 5                       | 20                     | 15             | 5 00   | 2 1/2                     | 32                      | 28                     | 103            | 26 00   |
| 2                         | 6                       | 20                     | 19             | 5 25   | 3                         | 14                      | 36                     | 65             | 19 50   |
| 2                         | 8                       | 20                     | 22             | 6 00   | 3                         | 16                      | 36                     | 67             | 20 75   |
| 2                         | 10                      | 20                     | 26             | 6 75   | 3                         | 18                      | 36                     | 77             | 22 00   |
| 2                         | 12                      | 20                     | 30             | 7 50   | 3                         | 20                      | 36                     | 85             | 23 25   |
| 2                         | 14                      | 20                     | 35             | 8 25   | 3                         | 22                      | 36                     | 89             | 24 50   |
| 2                         | 16                      | 20                     | 36             | 9 25   | 3                         | 24                      | 36                     | 102            | 25 75   |
| 2                         | 18                      | 20                     | 42             | 10 25  |                           |                         |                        |                |         |

## BARRETT COMPOUND LEVER JACKS

## DIMENSIONS AND PRICES

Fig. 1926



| No.      | Height with bar down, inches | Height with bar raised, inches | Size of bar, inches | Raise of bar, inches | Weight, pounds | Capacity, tons | Each    |
|----------|------------------------------|--------------------------------|---------------------|----------------------|----------------|----------------|---------|
| 1—Trip   | 24                           | 37 1/2                         | 1 1/2 x 1 1/2       | 13 1/2               | 62             | 10             | \$18 00 |
| 2—A. L.  | 21                           | 31                             | 1 3/8 x 1 1/2       | 10                   | 65             | 10             | 25 00   |
| 3—A. L.  | 26 1/2                       | 41 1/2                         | 1 1/2 x 1 7/8       | 15                   | 85             | 12             | 30 00   |
| 4—A. L.  | 22                           | 32                             | 1 1/8 x 2 1/8       | 10                   | 100            | 15             | 35 00   |
| 5—A. L.  | 28                           | 43                             | 1 1/8 x 2 1/8       | 15                   | 115            | 15             | 40 00   |
| 6—Trip   | 31                           | 50                             | 1 3/8 x 1 3/8       | 19                   | 105            | 15             | 32 00   |
| 8—A. L.  | 11                           | 16                             | 1 3/8 x 1 1/2       | 5                    | 48             | 10             | 22 00   |
| 10—A. L. | 24 1/2                       | 38 1/2                         | 1 1/2 x 1 1/2       | 14                   | 66             | 10             | 25 00   |
| 12—Trip  | 17 3/4                       | 25 3/8                         | 1 1/2 x 1 1/2       | 8                    | 50             | 10             | 17 00   |
| 17—Trip  | 24                           | 37 3/4                         | 1 1/2 x 1 1/2       | 13 3/4               | 63             | 10             | 18 00   |
| 18—A. L. | 21                           | 31                             | 1 3/8 x 1 1/2       | 10                   | 68             | 10             | 25 00   |
| 19—A. L. | 28                           | 45 1/2                         | 1 3/8 x 1 7/8       | 17 1/2               | 102            | 15             | 35 00   |
| 20—Trip  | 31                           | 50                             | 1 3/8 x 1 3/8       | 19                   | 106            | 15             | 32 00   |

## HARDWARE

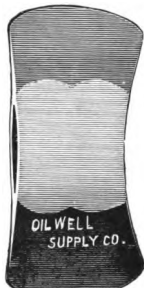
## AXES

Fig. 5588



Single bit

Fig. 5589



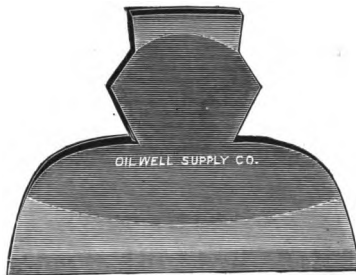
Double bit

Weights, assorted, 3 to 4½ lbs.

Single bit - - - - - per dozen, \$10 50  
 Double bit - - - - - per dozen, 15 00

## BROAD AXE

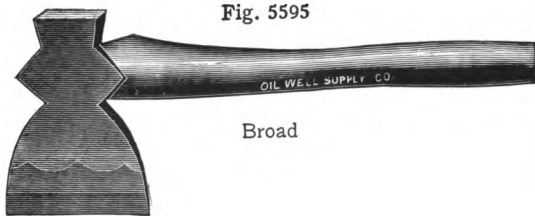
Fig. 5591



Weights, 6 to 7 lbs. - per dozen, \$32 00  
 Weights, 6½ to 7½ lbs. - per dozen, 32 00  
 Weights, 7 to 8 lbs. - per dozen, 35 00

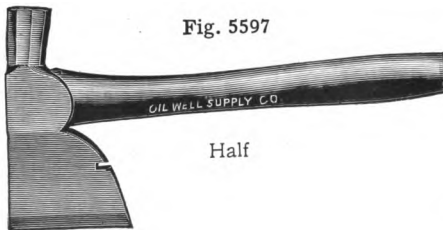
## HATCHETS

Fig. 5595



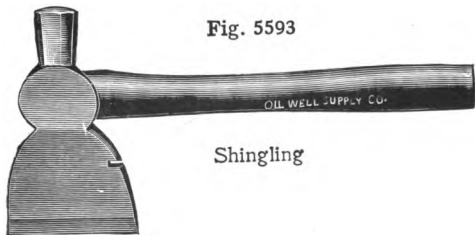
Broad

Fig. 5597



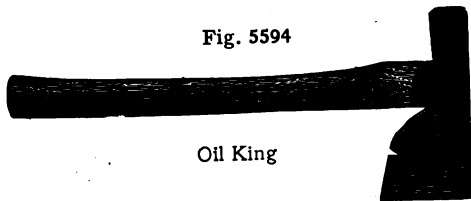
Half

Fig. 5593



Shingling

Fig. 5594



Oil King

| No. - - - - -                                         | 1       | 2     | 3       | 4     |
|-------------------------------------------------------|---------|-------|---------|-------|
| Broad, fig. 5595 - - - - - per dozen                  | \$10 50 | 11 50 | 13 00   | 14 50 |
| Broad, weight - - - - - lbs.                          | 1.5     | 1.7   | 2.1     | 2.5   |
| Half, common, fig. 5597 - - - - - per dozen           | \$8 00  | 8 50  | 9 00    | ----- |
| Half, solid steel, fig. 5597 - - - - - per dozen      | 10 00   | 11 00 | 12 00   | ----- |
| Half, weight - - - - - lbs.                           | .9      | 1.3   | 1.7     | ----- |
| Shingling, common, fig. 5593 - - - - - per dozen      | \$8 50  | 9 00  | 9 50    | ----- |
| Shingling, solid steel, fig. 5593 - - - - - per dozen | 10 50   | 11 50 | 12 50   | ----- |
| Shingling, weight - - - - - lbs.                      | 1       | 1.7   | 1.8     | ----- |
| Oil King, fig. 5594 - - - - - per dozen               | -----   | ----- | \$12 00 | ----- |
| Oil King, weight - - - - - lbs.                       | -----   | ----- | 1.8     | ----- |

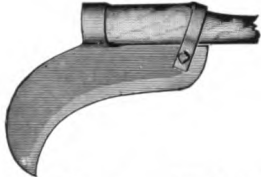
HARDWARE

ADZE  
Fig. 5600



Per dozen - - - - - \$24 00

BUSH HOOK  
Fig. 5800



No. 2, axe handle - - per dozen, \$18 00

Fig. 5626



SOCKET FIRMER CHISEL

| Size - - - - inches | $\frac{1}{8}$ | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | 1     | $1\frac{1}{8}$ | $1\frac{1}{4}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ | 2 |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------|----------------|----------------|----------------|----------------|---|
| Per dozen - - - -   | \$11 00       | 11 00         | 11 00         | 12 00         | 13 00         | 13 00         | 14 00         | 15 00 | 16 00          | 17 00          | 18 00          | 19 00          |   |

Fig. 5630



CORNER CHISEL

| Size - - - - inches | $\frac{1}{2}$ | $\frac{3}{4}$ | $\frac{1}{2}$ | 1     | $1\frac{1}{8}$ | $1\frac{1}{4}$ | $1\frac{1}{2}$ |
|---------------------|---------------|---------------|---------------|-------|----------------|----------------|----------------|
| Per dozen - - - -   | \$30 00       | 32 00         | 34 00         | 36 00 | 38 00          | 40 00          | 44 00          |

Fig. 5628



CARPENTERS' GOUGE  
SOCKET FIRMER

| Size - - - - inches     | $\frac{1}{2}$ | $\frac{3}{4}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1     | $1\frac{1}{8}$ | $1\frac{1}{4}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ | 2 |
|-------------------------|---------------|---------------|---------------|---------------|-------|----------------|----------------|----------------|----------------|---|
| Millwrights - per dozen | \$16 00       | 17 00         | 18 00         | 19 00         | 20 00 | 22 00          | 24 00          | 26 00          | 28 00          |   |
| Common - per dozen      | 8 00          | 8 50          | 9 00          | 9 50          | 10 00 | 11 00          | 12 00          | 13 00          | 14 00          |   |

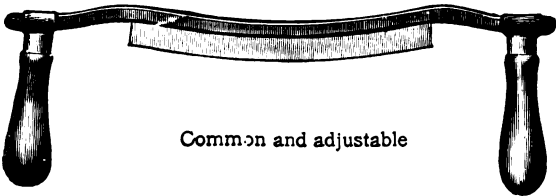
Fig. 5632



CARPENTERS' SLICK

| Size - - - - inches | $2\frac{1}{2}$ | 3     | $3\frac{1}{2}$ | 4     |
|---------------------|----------------|-------|----------------|-------|
| Per dozen - - - -   | \$45 00        | 50 00 | 55 00          | 60 00 |

Fig. 5614



Common and adjustable

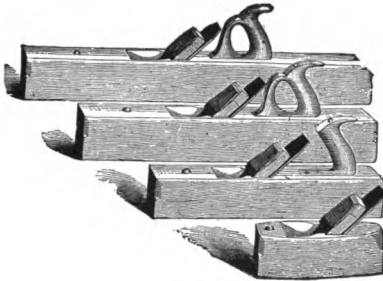
DRAWING KNIFE

| Length, in. | 9       | 10    | 12    |
|-------------|---------|-------|-------|
| Per dozen   | \$24 00 | 25 00 | 27 00 |

Adjustable, 10 in., per doz., \$15 00

## HARDWARE

**Fig. 5636**



**JOINTER**

**FORE**

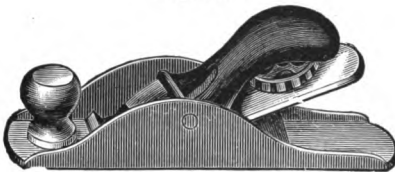
**JACK**

**SMOOTH**

## BENCH PLANES

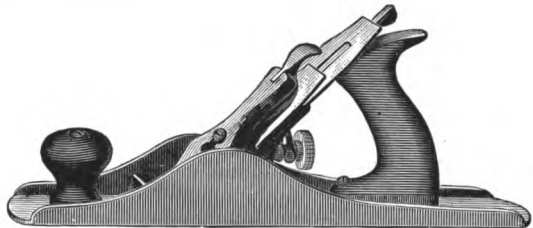
|                 |   |   |   |   |   |        |
|-----------------|---|---|---|---|---|--------|
| Smooth, No. 7   | - | - | - | - | - | \$0 90 |
| Jack, No. 8     | - | - | - | - | - | 1 00   |
| Fore No. 9      | - | - | - | - | - | 1 70   |
| Jointer, No. 10 | - | - | - | - | - | 1 80   |

**BLOCK**  
**Fig. 5638**

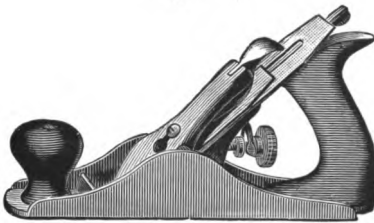


## IRON PLANES

**JACK**  
**Fig. 5642**



**SMOOTH**  
**Fig. 5640**

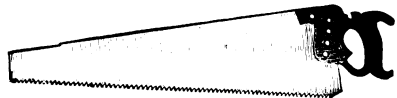


|                          | Length,<br>inches | Width of<br>cutter, inches | Price  |
|--------------------------|-------------------|----------------------------|--------|
| Block, fig. 5638 - -     | 7½                | 1½                         | \$0 60 |
| Block, adjustable - -    | 7½                | 1½                         | 85     |
| Smooth, fig. 5640 - -    | 5½                | 1½                         | 2 25   |
| Smooth, fig. 5640 - -    | 7                 | 1½                         | 2 75   |
| Smooth, fig. 5640 - -    | 8                 | 1½                         | 3 00   |
| Smooth, fig. 5640 - -    | 9                 | 2                          | 3 25   |
| Smooth, fig. 5640 - -    | 10                | 2½                         | 3 75   |
| Jack, fig. 5642 - - -    | 14                | 2                          | 3 75   |
| Jack, fig. 5642 - - -    | 15                | 2½                         | 4 25   |
| Fore, not illustrated -  | 18                | 2½                         | 4 75   |
| Jointer, not illustrated | 22                | 2¾                         | 5 50   |
| Jointer, not illustrated | 24                | 2¾                         | 6 50   |

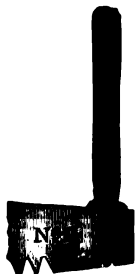
**Fig. 5648**

## HAND SAWS

**Fig. 5646**



|                                                 |   |   |   |   |   |   |   |   |   |            |         |
|-------------------------------------------------|---|---|---|---|---|---|---|---|---|------------|---------|
| O. W. S. Co., special, 26 inch, hand, fig. 5648 | - | - | - | - | - | - | - | - | - | per dozen, | \$12 00 |
| Disston's, No. 7, 26 inch, hand, fig. 5646      | - | - | - | - | - | - | - | - | - | per dozen, | 20 00   |
| Disston's, No. 8, 26 inch, hand, fig. 5646      | - | - | - | - | - | - | - | - | - | per dozen, | 21 50   |
| Disston's, No. D8. 26 inch, hand, fig. 5646     | - | - | - | - | - | - | - | - | - | per dozen, | 22 50   |
| Disston's, No. 7, 28 inch, hand, rip            | - | - | - | - | - | - | - | - | - | per dozen, | 23 50   |
| Disston's, No. 12, 26 inch, hand, rip           | - | - | - | - | - | - | - | - | - | per dozen, | 29 00   |
| Moore Bros.' special No. 8 hand, fig. 5648      | - | - | - | - | - | - | - | - | - | per dozen, | 20 00   |

**HARDWARE****CROSS CUT SAW AND HANDLES****Fig. 5652****Fig. 5654****Fig. 5655**

|                         |         |           |        |
|-------------------------|---------|-----------|--------|
| Crosscut Saws           | - - - - | per foot, | \$0 60 |
| Handles, fig. 5654      | - - - - | per pair, | 28     |
| Handles, fig. 5655      | - - - - | per pair, | 36     |
| Handles, Climax No. 103 | - - - - | per pair, | 35     |

**COMPASS SAW****Fig. 5650**

|         |         |            |        |
|---------|---------|------------|--------|
| 10 inch | - - - - | per dozen, | \$4 25 |
| 12 inch | - - - - | per dozen, | 4 50   |
| 14 inch | - - - - | per dozen, | 4 75   |
| 16 inch | - - - - | per dozen, | 5 00   |
| 18 inch | - - - - | per dozen, | 5 25   |

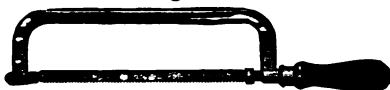
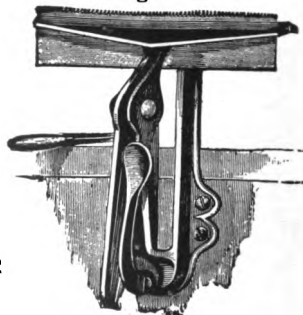
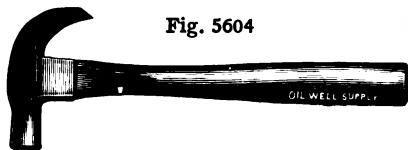
**HACK SAW AND FRAME****Fig. 5659****HACK SAW BLADE****Fig. 5660**

Fig. 5659, nickel plated frame, adjustable to 4 angles. Frame 8 inches, one blade with each frame - - - - - per dozen, \$11 00

|                          |         |           |        |    |    |      |      |    |
|--------------------------|---------|-----------|--------|----|----|------|------|----|
| Length                   | - - - - | inches    | 8      | 9  | 10 | 12   | 14   | -- |
| Flexible hack saw blades | -       | per dozen | \$0 65 | 70 | 85 | 1 05 | 1 67 | -- |

**Fig. 5644****SAW SET AND VISE****Fig. 5657**

|                                |         |            |        |
|--------------------------------|---------|------------|--------|
| Sets for hand saws, fig. 5644  | - - - - | per dozen, | \$8 00 |
| Sets for crosscut saws         | - - - - | per dozen, | 15 00  |
| Stearn's No. 0 vise, fig. 5657 | - - - - | per dozen, | 10 00  |

**ADZE EYE NAIL HAMMER****Fig. 5604**

| Number | Weight      | Per dozen | Number | Weight | Per dozen |
|--------|-------------|-----------|--------|--------|-----------|
| 1      | 1 lb. 4 oz. | \$9 00    | 2      | 13 oz. | \$8 00    |
| 1½     | 1 lb.       | 8 50      | 3      | 7 oz.  | 7 50      |

**HARDWARE****Fig. 5608****RIVETING HAMMER  
PLAIN EYE**

| No. | Weight      | Per dozen |
|-----|-------------|-----------|
| 6   | 1 lb. 6 oz. | \$7 50    |
| 5   | 1 lb. 2 oz. | 7 00      |
| 4   | 15 oz.      | 6 50      |

**Fig. 5610****RIVET SET**

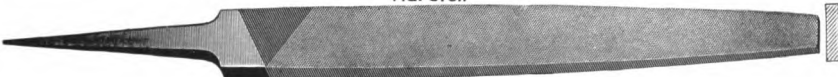
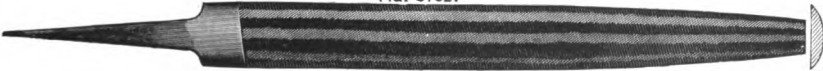
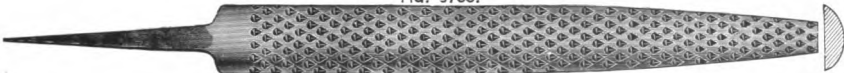
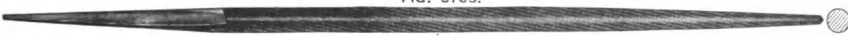
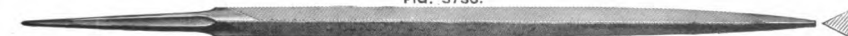
| Size No. -  | 00 and 0 | 1 and 2 | 3 and 4 | 5 and 6 | 7 and 8 |
|-------------|----------|---------|---------|---------|---------|
| Per dozen - | \$9 00   | 7 50    | 6 00    | 4 50    | 3 75    |

**Fig. 5537****PICK**

|              |   |   |   |                    |
|--------------|---|---|---|--------------------|
| 5 to 6 pound | - | - | - | per dozen, \$12 50 |
| 6 to 7 pound | - | - | - | per dozen, 13 50   |

**Fig. 5538****MATTOCK**

|          |   |   |   |   |   |                    |
|----------|---|---|---|---|---|--------------------|
| 5 pound  | - | - | - | - | - | per dozen, \$16 00 |
| 5½ pound | - | - | - | - | - | per dozen, 16 50   |
| 6 pound  | - | - | - | - | - | per dozen, 17 00   |

**FILES****MILL BASTARD.  
FIG. 5730.****FLAT BASTARD.  
FIG. 5731.****HALF-ROUND BASTARD.  
FIG. 5732.****HALF-ROUND WOOD RASP.  
FIG. 5733.****SQUARE BASTARD  
FIG. 5734.****ROUND BASTARD.  
FIG. 5735.****TAPER SAW.  
FIG. 5736.**

For list, see next page



## HARDWARE



AUGER—Fig. 5577

|                       |                |                |                |                |                |                |                |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Size - - - - - inches | $\frac{1}{2}$  | $\frac{3}{4}$  | $1\frac{1}{4}$ | $1\frac{3}{4}$ | 1              | $1\frac{1}{2}$ | $1\frac{3}{4}$ |
| Per dozen - - - - -   | \$8 25         | 9 50           | 10 75          | 12 00          | 13 25          | 15 00          | 17 00          |
| Size - - - - - inches | $1\frac{1}{2}$ | $1\frac{3}{4}$ | 2              | $2\frac{1}{4}$ | $2\frac{3}{4}$ | $2\frac{1}{2}$ | 3              |
| Per dozen - - - - -   | \$22 00        | 26 00          | 30 00          | 40 00          | 50 00          | 70 00          | 90 00          |

## IRWIN'S SOLID CENTER AUGER

|                   |               |               |                |                |       |                |                |                |                |       |
|-------------------|---------------|---------------|----------------|----------------|-------|----------------|----------------|----------------|----------------|-------|
| Size - - inches   | $\frac{1}{2}$ | $\frac{3}{4}$ | $1\frac{1}{4}$ | $1\frac{3}{4}$ | 1     | $1\frac{1}{2}$ | $1\frac{3}{4}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ | 2     |
| Per dozen - - - - | \$8 25        | 9 50          | 10 75          | 12 00          | 13 25 | 15 00          | 17 00          | 22 00          | 26 00          | 30 00 |



AUGER BIT—Fig. 5576

|                 |        |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------------|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Size in 16ths - | 3      | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
| Com'n per doz.  | \$4 50 | 4 00 | 4 00 | 4 00 | 4 50 | 5 00 | 5 50 | 6 00 | 7 00 | 7 00 | 8 00 | 8 00 | 9 00 | 9 00 |



IRWIN'S SOLID CENTER AUGER BIT—Fig. 5575

|                     |        |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------|--------|------|------|------|------|------|------|------|------|------|------|------|------|
| Size in 16ths - - - | 4      | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
| Per dozen - - - -   | \$4 00 | 4 00 | 4 00 | 4 50 | 5 00 | 5 50 | 6 00 | 7 00 | 7 00 | 8 00 | 8 00 | 9 00 | 9 00 |

## SHIP AUGER WITH SCREW—Fig. 5581



36 inches long, with 18 or 20 inch twist

|                               |               |                |                |       |                |                |                |                |                |
|-------------------------------|---------------|----------------|----------------|-------|----------------|----------------|----------------|----------------|----------------|
| Size - - - - - inches         | $\frac{3}{4}$ | $1\frac{1}{4}$ | $1\frac{3}{4}$ | 1     | $1\frac{1}{2}$ | $1\frac{3}{4}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ | $1\frac{1}{2}$ |
| 18 inch twist - - - per dozen | \$25 50       | 28 50          | 32 10          | 35 70 | 39 30          | 42 90          | 47 70          | 52 50          |                |
| 20-inch twist - - - per dozen | \$28 80       | 32 10          | 36 00          | 39 90 | 43 80          | 47 70          | 52 80          | 57 90          |                |

## IRWIN'S DERRICK OR SHIP AUGER—Fig. 5583



18" twist, 18" shank

|                     |         |       |       |       |       |       |       |       |       |       |
|---------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Size in 16ths - - - | 8       | 10    | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 20    |
| Per dozen - - - -   | \$21 00 | 27 90 | 31 80 | 34 50 | 36 30 | 39 00 | 40 80 | 43 50 | 45 30 | 49 80 |

Made with either single or double cutter



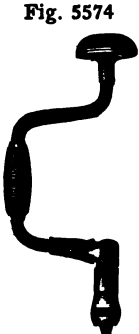
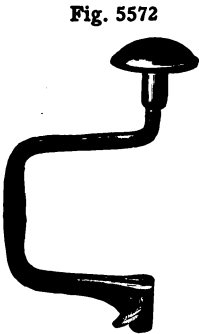
CAR AUGER—Fig. 5579

|                         |         |       |       |       |       |       |       |       |
|-------------------------|---------|-------|-------|-------|-------|-------|-------|-------|
| Size in 16ths - - - - - | 4       | 5     | 6     | 7     | 8     | 9     | 10    | 11    |
| Per dozen - - - - -     | \$9 00  | 9 00  | 9 00  | 10 00 | 11 25 | 12 50 | 13 75 | 15 00 |
| Size in 16ths - - - - - | 12      | 13    | 14    | 15    | 16    | 17    | 18    | 20    |
| Per dozen - - - - -     | \$16 25 | 17 50 | 19 00 | 20 50 | 22 00 | 24 00 | 26 00 | 30 00 |



HARDWARE

BRACES FOR BITS



| Size                                   |           | inches    | 10      | 12    |
|----------------------------------------|-----------|-----------|---------|-------|
| Fig. 5570, Fray's Sleeve, No. 210-212  | - - - - - | per dozen | \$27 00 | 30 00 |
| " " " 310-312                          | - - - - - | " "       | 18 00   | 20 00 |
| Fig. 5574, Fray's Ratchet, No. 101-121 | - - - - - | " "       | 36 00   | 39 00 |
| " " " 102-122                          | - - - - - | " "       | 27 00   | 30 00 |
| Fig. 5572, Spofford's, " 10-12         | - - - - - | " "       | 23 00   | 27 00 |

Fig. 5663



SWAN'S PATENT IRON FRAME  
BORING MACHINE

UPRIGHT

Fig. 5663

Painted standard, without augers - \$8 50

BABBITT METAL

Genuine - - - - - per pound, \$0 60  
No. 4 - - - - - per pound, 12

MELTING LADLE

Fig. 5533



| Melting ladles - - - - - number               | 1         | 2         | 3         | 4         | 6         | 7      |
|-----------------------------------------------|-----------|-----------|-----------|-----------|-----------|--------|
| Diameter of bowl - - - - - inches             | 2½        | 3         | 3½        | 4         | 5         | 6      |
| Per dozen - - - - -                           | \$3 75    | 4 65      | 5 50      | 6 50      | 8 75      | 10 00  |
| Long handle, with 6 inch bowl, each - - - - - | - - - - - | - - - - - | - - - - - | - - - - - | - - - - - | \$1 25 |

## HARDWARE

## PLUMB AND LEVEL

Fig. 5612



No. 490½, Adjustable - - - - - per dozen, \$12 25  
 No. 290, Non-adjustable - - - - - " " 8 25

## CHALK

| Color - - -   | White  | Red  | Blue |
|---------------|--------|------|------|
| Per gross - - | \$1 30 | 1 80 | 2 00 |

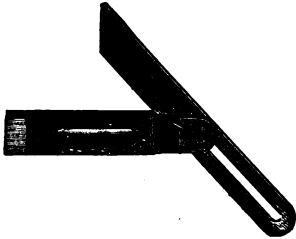
## CHALK LINE REELS

Per dozen - - - - - \$0 95

## CARPENTERS' PENCILS

No. 35, 9 inch - - - - - per dozen, \$0 50

Fig. 5669



## CHALK LINES

No. 6, 20 ft. long - - - per dozen, \$0 50  
 No. 6, 40 ft. long - - - per dozen, 1 00

## SCRATCH AWLS

No. 2- - - - - per dozen, \$0 75

## MARKING GAUGE

Fig. 5671



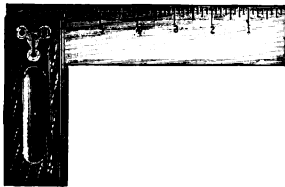
Per dozen - - - - - \$1 00

## SLIDING T BEVEL—Fig. 5669

| Size - - - inches | 6      | 8    | 10   | 12   | 14   |
|-------------------|--------|------|------|------|------|
| Per dozen - - - - | \$5 50 | 6 00 | 6 50 | 7 00 | 7 50 |

## TRY SQUARE—Fig. 5665

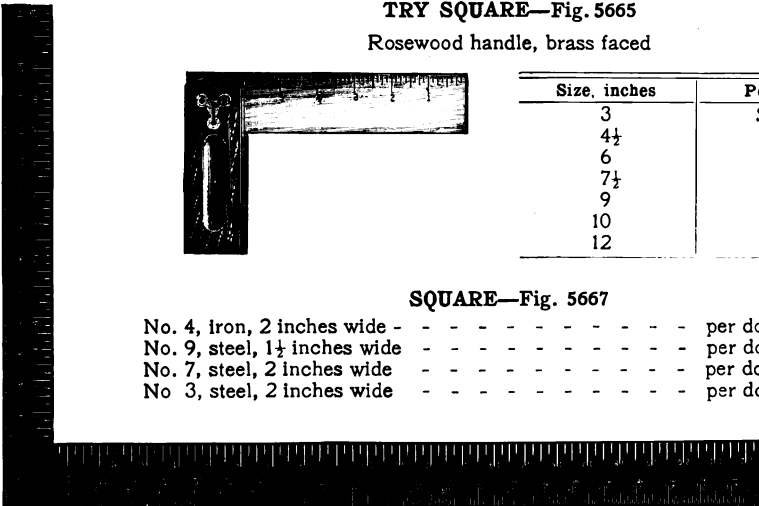
Rosewood handle, brass faced



| Size, inches | Per dozen |
|--------------|-----------|
| 3            | \$1 80    |
| 4½           | 2 25      |
| 6            | 3 00      |
| 7½           | 3 45      |
| 9            | 3 90      |
| 10           | 4 35      |
| 12           | 5 10      |

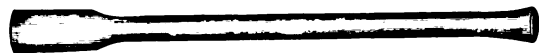
## SQUARE—Fig. 5667

No. 4, iron, 2 inches wide - - - - - per dozen, \$12 50  
 No. 9, steel, 1½ inches wide - - - - - per dozen, 22 00  
 No. 7, steel, 2 inches wide - - - - - per dozen, 23 50  
 No. 3, steel, 2 inches wide - - - - - per dozen, 27 50

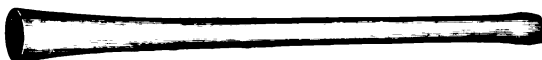


**HARDWARE****HANDLES**

**Fig. 5694**  
Single bit axe - - per doz., \$3 20



**Fig. 5696**  
Double bit axe - - per doz., 3 20



**Fig. 5698**  
Pick - - - per doz., 3 50  
Mattock - - - per doz., 3 50



**Fig. 5700**  
Sledge - - - per doz., 2 10



**Fig. 5702**  
Adze - - - per doz., 3 50



**Fig. 5704**  
Adze eye hammer - - - per doz., 60



**Fig. 5710**  
Hatchet - - - per doz., 60  
For Oil King hatchet - - - per doz., 1 00

**Fig. 5714****AUGER****Fig. 5716**

Common - - - per doz., \$0 50



Patent - - - per doz., \$12 00

**Fig. 5720**

Swan's No. 24 - - - per doz., \$12 00

**Fig. 5721**

Pratt's No. 1 or No. 2 - - per doz., \$12 00



**Fig. 5712.**  
File - - - per doz., 75

**HAMMER HANDLES—BALL PEEN**

Not illustrated

|                      |                   |                      |               |
|----------------------|-------------------|----------------------|---------------|
| 15 inches long - - - | per dozen, \$0 60 | 18 inches long - - - | per dozen, 80 |
| 16 inches long - - - | per dozen, 70     | 20 inches long - - - | per dozen, 90 |

**MISCELLANEOUS**

|                                                      |                 |
|------------------------------------------------------|-----------------|
| Broad axe, not illustrated - - -                     | per dozen, 3 25 |
| Socket firmer chisel, not illustrated - - -          | per dozen, 50   |
| Socket firmer chisel, framing, not illustrated - - - | per dozen, 75   |
| Hand saw, not illustrated - - -                      | per dozen, 1 40 |
| Jack plane handles, not illustrated - - -            | per dozen, 50   |
| Shovel D handles, not illustrated - - -              | per dozen, 3 35 |
| Shovel long handles, not illustrated - - -           | per dozen, 2 50 |

**SCREW DRIVERS**

|                   |        |      |      |      |      |      |      |      |
|-------------------|--------|------|------|------|------|------|------|------|
| Length - - inches | 3      | 4    | 5    | 6    | 7    | 8    | 10   | 12   |
| Per dozen - - -   | \$2 00 | 2 50 | 3 00 | 3 50 | 4 00 | 4 75 | 6 00 | 8 00 |

# HARDWARE

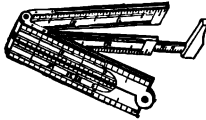
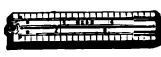
## RULES

Fig. 5673

Fig. 5674

Fig. 5676

Fig. 5675



6-inch caliper

12-inch

12-inch caliper

24-inch

|                                                                                     |   |   |   |                   |
|-------------------------------------------------------------------------------------|---|---|---|-------------------|
| No. 36, caliper, square joint, 2 fold, 6 inch, $\frac{7}{8}$ inch wide, fig. 5673   | - | - | - | per dozen, \$4 50 |
| No. 32 $\frac{1}{2}$ , caliper, arch joint, 4 fold, 12 inch, 1 inch wide, fig. 5676 | - | - | - | per dozen, 10 00  |
| No. 65, square joint, 4 fold, 12 inch, $\frac{5}{8}$ inch wide, fig. 5674           | - | - | - | per dozen, 2 00   |
| No. 57, arch joint, bound, 4 fold, 12 inch, $\frac{5}{8}$ inch wide, fig. 5674      | - | - | - | per dozen, 6 25   |
| No. 61, square joint, 4 fold, 24 inch, 1 inch wide, fig. 5675                       | - | - | - | per dozen, 3 00   |
| No. 62, square joint, bound, 4 fold, 24 inch, 1 inch wide, fig. 5675                | - | - | - | per dozen, 8 00   |

Fig. 5678

## ASSES' SKIN TAPE MEASURE



|                       |        |      |      |      |      |      |
|-----------------------|--------|------|------|------|------|------|
| Length - - - - - feet | 25     | 30   | 40   | 50   | 75   | 100  |
| Per dozen - - - - -   | \$3 75 | 4 00 | 4 50 | 5 00 | 7 50 | 9 00 |

## STEEL TAPE MEASURE

Fig. 5679

Fig. 5681

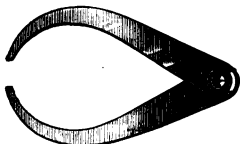


|                                                           |        |       |       |        |       |       |       |
|-----------------------------------------------------------|--------|-------|-------|--------|-------|-------|-------|
| Length - - - - - feet                                     | 25     | 33    | 40    | 50     | 66    | 75    | 100   |
| Steven's excelsior - - - - - each                         | -----  | ----- | ----- | \$7 15 | ----- | ----- | 12 90 |
| Home, fig. 5679 - - - - - each                            | \$3 20 | ----- | ----- | 3 90   | ----- | 5 10  | 6 60  |
| Harvard excelsior, fig. 5681 - - - each                   | 2 00   | 2 25  | ----- | 2 75   | 3 10  | 3 35  | 4 10  |
| Lufkin, "metallic" leather case, fig. 5681 - - - - - each | 1 70   | 2 00  | ----- | 2 50   | 2 80  | 3 10  | 3 90  |
| Challenge, not illustrated - - - - each                   | 3 25   | ----- | ----- | 4 00   | ----- | 5 25  | 6 75  |
| Chesterman's steel - - - - - each                         | 4 50   | 5 20  | 6 00  | 7 20   | 9 20  | 10 40 | 12 80 |
| Chesterman's wired - - - - - each                         | 1 80   | 2 10  | 2 30  | 2 60   | 3 00  | 3 30  | 4 20  |

## CALIPERS

Fig. 5683

Fig. 5684



Outside

Inside

|                          |        |    |    |    |    |    |      |      |      |      |      |      |
|--------------------------|--------|----|----|----|----|----|------|------|------|------|------|------|
| Size - - - inches        | 3      | 4  | 5  | 6  | 8  | 10 | 12   | 14   | 16   | 18   | 20   | 24   |
| Outside or inside - each | \$0 40 | 50 | 55 | 65 | 80 | 90 | 1 00 | 1 50 | 1 75 | 2 10 | 2 50 | 3 00 |

# **HARDWARE**

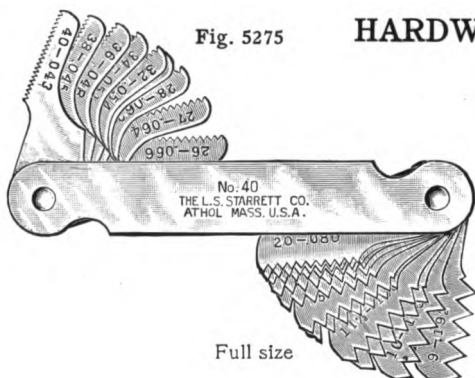


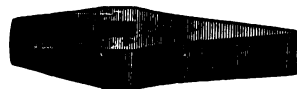
Fig. 5275

**COLD CHISEL**  
**Fig. 5529**


Per pound - - - - \$0 38

**THREAD GAUGE**

No. 11½, 16 leaves - - - - \$1 00  
 No. 24, 4 leaves - - - - 50

**SPLITTING CHISEL**  
**Fig. 5531**


Per pound - - - - \$0 42

**PUNCH**  
**Fig. 5527**

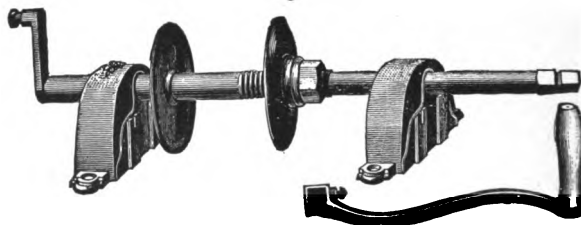

Per pound - - - - \$0 38

**CROWBARS**

Per pound - - - - \$0 12

**HOOP DRIVER**  
**Fig. 5540**


Per pound - - - - \$0 35

**GRINDSTONE FIXTURES**  
**Fig. 5616**


|                              |        |      |      |      |
|------------------------------|--------|------|------|------|
| Length of shaft - - - inches | 24     | 19   | 17   | 15   |
| Complete set - - - - -       | \$2 00 | 1 75 | 1 50 | 1 25 |

**OIL STONES**

|                            | Stone  | Slips |
|----------------------------|--------|-------|
| Washita, No. 1 - per pound | \$0 40 | 70    |

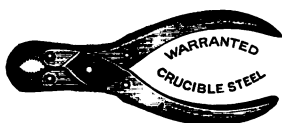
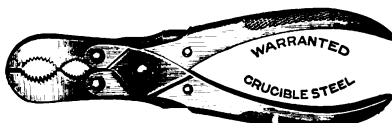
**GRINDSTONES**

Not illustrated

Per pound - - - - \$0 02

**BENCH SCREWS**

|                              |         |       |       |       |      |      |      |
|------------------------------|---------|-------|-------|-------|------|------|------|
| Size screw - - - - inches    | 1       | 1½    | 1¾    | 1½    | 2    | 2½   | 2¾   |
| Length screw - - - inches    | 15      | 16    | 17    | 19    | ---  | ---  | ---  |
| Wrought iron - - - per dozen | \$10 00 | 11 00 | 15 00 | 21 70 | ---  | ---  | ---  |
| Wood - - - - - per dozen     | -----   | ----- | ----- | ----- | 3 30 | 3 75 | 6 00 |

**HARDWARE****BURNER AND GAS PLIERS****Fig. 5685****Fig. 5687**

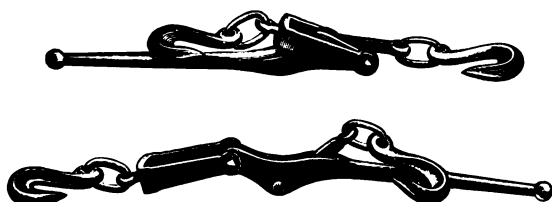
|                     |        |                         |                         |
|---------------------|--------|-------------------------|-------------------------|
| Size - - - - -      | inches | 5 (one hole), fig. 5685 | 7 (two hole), fig. 5687 |
| Per dozen - - - - - |        | \$9 50                  | 12 00                   |

**COMBINATION PLIERS AND CUTTING NIPPERS—Fig. 5689**

| Size, inches | Cuts wire up to | Per dozen |
|--------------|-----------------|-----------|
| 4            | 14 gauge        | \$10 00   |
| 6            | 11 gauge        | 12 00     |
| 8            | 8 gauge         | 15 00     |
| 10           | 6 gauge         | 20 00     |
| 12           | 5 gauge         | 30 00     |

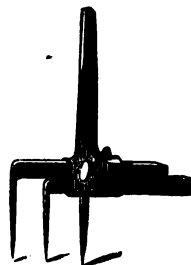
**PEASE COMBINATION PLIERS Fig. 5688**

| Size, inches | Capacity, size pipe, inches | Black, per dozen | Nickel plated, per dozen |
|--------------|-----------------------------|------------------|--------------------------|
| 6            | $\frac{3}{4}$               | \$13 50          | 15 00                    |
| 8            | 1                           | 16 00            | 18 00                    |
| 10           | 1                           | 18 00            | 21 00                    |
| 14           | 1                           | 24 00            | 30 00                    |

**GOODYEAR LOAD BINDER****Fig. 5824**

For securely binding loads of pipe, sucker rods, etc.

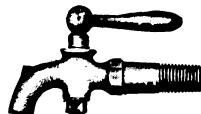
Per pair - - - - - \$5 00

**WASHER CUTTER—Fig. 5235**

Regular - - - - - per dozen, \$11 00  
Large - - - - - per dozen, 14 00

**PETROLEUM OIL FAUCET**

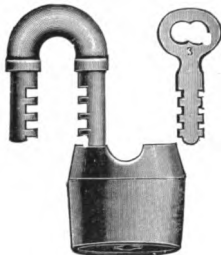
|                       |               |               |               |               |       |
|-----------------------|---------------|---------------|---------------|---------------|-------|
| Numbers - - - - -     | 13            | 14            | 5             | 6             | 7     |
| Size - - - - - inches | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | 1     |
| Per dozen - - - - -   | \$10 00       | 11 00         | 13 00         | 16 00         | 23 00 |

**Fig. 5870**

HARDWARE

PADLOCKS

Fig. 5777



No. 1694-1695

Fig. 5777-B



Fig. 5777-C



- Fig. 5777, No. 1694—Scandinavian or jail, two keys - - - - - per dozen, \$4 00  
Fig. 5777, No. 1695—Scandinavian or jail, two keys - - - - - per dozen, 4 50  
Fig. 5777-B, No. 10—Champion 6 lever, 2½ inch, brass, two keys, 10-inch chain - - - - - per dozen, 14 00  
Fig. 5777-C, No. 1—Champion, same, no chain - - - - - per dozen, 12 00  
Fig. 5777-C, No. 9—Champion, same, elongated shackle - - - - - per dozen, 15 00  
Fig. 5777-C, No. 7—Champion, same, elongated shackle, no chain - - - per dozen, 13 00

NOTE.—The Champion 6-lever padlock keys all differ, unless made alike to order.  
If made with keys alike, to pass, add \$1.00 per dozen.  
If made with both master and special keys, add \$6.00 per dozen.

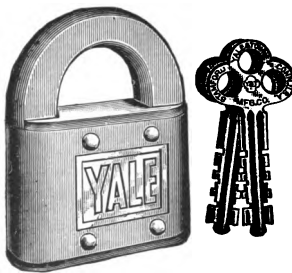
YALE PADLOCKS

Fig. 5778



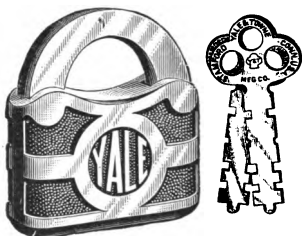
No. 805

Fig. 5578-D



No. 8454

Fig. 5778-C

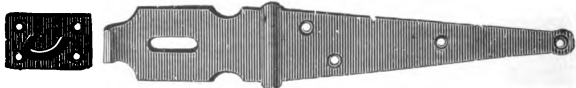


No. 853

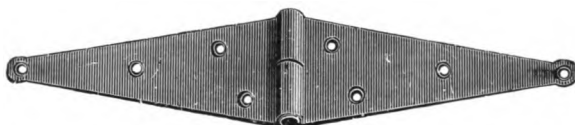
- Fig. 5778, No. 805—Cast iron case and bronze shackle - - - - - per dozen, \$15 40  
Fig. 5778-D, No. 8454—Steel shell and shackle - - - - - per dozen, 21 00  
Fig. 5778-C, No. 853—Bronze case and bronze shackle - - - - - per dozen, 31 00

HINGE HASP AND STAPLE

Fig. 5779



|           |                  |       |    |    |      |      |      |
|-----------|------------------|-------|----|----|------|------|------|
| Size      | - - - - - inches | 3     | 4½ | 6  | 8    | 10   | 12   |
| Per dozen | - - - - -        | \$ 50 | 60 | 80 | 1 05 | 1 50 | 2 10 |

**HARDWARE****STRAP AND TEE HINGES, HEAVY****Fig. 5781****Tee hinges not illustrated**

| Size - - - - - inches           | 4      | 5    | 6    | 8    | 10   | 12   | 14   | 16   |
|---------------------------------|--------|------|------|------|------|------|------|------|
| Strap hinges - - per dozen pair | \$1 60 | 2 15 | ---  | ---  | ---  | ---  | ---  | ---  |
| Strap hinges - - - per pound    | ---    | ---  | 15   | 13½  | 13   | 13   | 13   | 13   |
| Tee hinges - - per dozen pair   | 90     | 1 05 | 1 25 | 1 55 | 2 30 | 3 20 | 4 45 | 5 40 |
| Hasps with staples - per dozen  | ---    | 90   | 1 00 | 1 30 | 2 00 | ---  | ---  | ---  |
| Hasps with hook - - per dozen   | ---    | 1 20 | 1 40 | 1 80 | 2 50 | ---  | ---  | ---  |

**HOOKS AND STAPLES**

Not illustrated

| Size, inches | 3½     | 4     | 4½    | 5     | 6     |
|--------------|--------|-------|-------|-------|-------|
| Per gross -  | \$9 00 | 10 00 | 11 00 | 12 00 | 14 00 |

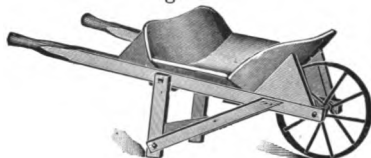
**STAPLES**

Not illustrated

| Size - inches | 2      | 2½   | 2¾   | 3    |
|---------------|--------|------|------|------|
| Per gross - - | \$1 70 | 2 00 | 2 35 | 3 20 |

**Fig. 5804****CHAIN, STEEL OR IRON****B. B. B. X.**

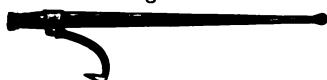
| Size - - - inches | 1¾ & 1 | 1½ | 1 & over |
|-------------------|--------|----|----------|
| Per pound - - - - | \$0 15 | 12 | 10       |

**Fig. 5802****WHEELBARROW**

| No. |                            | Per dozen |
|-----|----------------------------|-----------|
| 3   | With wood wheel - - - - -  | \$22 00   |
| 4   | With steel wheel - - - - - | 24 00     |

**CLIP PEAVIE****Fig. 5807**

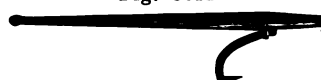
Per dozen - - - - - \$22 50

**CLIP CANT HOOK****Fig. 5810**

Per dozen - - - - - \$21 00

**Fig. 5823****SOCKET PEAVIE****Fig. 5808**

Per dozen - - - - - \$23 50

**SOCKET CANT HOOK****Fig. 5811**

Per dozen - - - - - \$22 00

**SCOOP**

No. 4, steel, half polished - per dozen, \$15 50  
 No. 5, steel, half polished - per dozen, 16 00  
 No. 6, steel, half polished - per dozen, 16 50



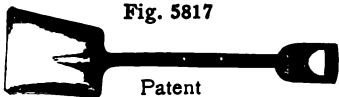
HARDWARE  
SHOVELS

D HANDLE  
Fig. 5815



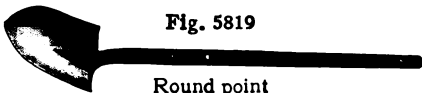
Common

D HANDLE  
Fig. 5817



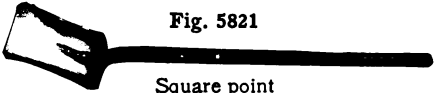
Patent

LONG HANDLE  
Fig. 5819



Round point

LONG HANDLE  
Fig. 5821



Square point

CANAL SHOVELS—BLACK—HOLLOW BACK

D or long handle, round or square point, same price.

|                         |                 |                  |                  |                  |                  |                  |
|-------------------------|-----------------|------------------|------------------|------------------|------------------|------------------|
| Size No. - - - - -      | 2               | 3                | 4                | 5                | 6                | 7                |
| Width - - - - - inches  | 9 $\frac{1}{2}$ | 10 $\frac{1}{2}$ | 10 $\frac{3}{4}$ | 11 $\frac{1}{2}$ | 11 $\frac{3}{4}$ | 12               |
| Length - - - - - inches | 12              | 12 $\frac{1}{2}$ | 13               | 13 $\frac{1}{2}$ | 14               | 14 $\frac{1}{2}$ |
| Per dozen - - - - -     | \$18 00         | 19 00            | 20 00            | 21 00            | 22 00            | 23 00            |

COAL SHOVELS—BLACK—HOLLOW BACK

D or long handle same price.

|                         |                  |                  |                  |
|-------------------------|------------------|------------------|------------------|
| Size No. - - - - -      | 1                | 2                | 3                |
| Width - - - - - inches  | 13 $\frac{1}{2}$ | 14 $\frac{1}{2}$ | 14 $\frac{3}{4}$ |
| Length - - - - - inches | 14 $\frac{1}{2}$ | 14 $\frac{3}{4}$ | 15               |
| Per dozen - - - - -     | \$20 00          | 21 00            | 22 00            |

DITCHING SPADES

|                       |         |       |       |       |
|-----------------------|---------|-------|-------|-------|
| Size - - - - - inches | 14      | 16    | 18    | 20    |
| Per dozen - - - - -   | \$24 00 | 24 50 | 25 00 | 26 00 |

POST HOLE AUGER—Fig. 5825

Sizes 4, 5, 6, 7, 8, and 9 inches - - - - - per dozen, \$18 00

Fig. 5825

IWANS POST HOLE AUGERS—Not illustrated

|                       |         |       |       |       |       |
|-----------------------|---------|-------|-------|-------|-------|
| Size - - - - - inches | 4 to 6  | 7     | 8     | 9     | 10    |
| Per dozen - - - - -   | \$28 00 | 30 00 | 30 00 | 32 00 | 36 00 |



MALLEABLE IRON OILER

|                               |        |      |      |
|-------------------------------|--------|------|------|
| Size No. - - - - -            | 1      | 2    | 3    |
| Old style - - - - - per dozen | \$3 60 | 4 00 | 4 40 |
| Size No. - - - - -            | 11     | 12   | 13   |
| New style - - - - - per dozen | \$3 60 | 4 00 | 4 40 |
| Tubes - - - - - per dozen     | 1 80   | 1 80 | 1 80 |

GEM OILER—Not illustrated

No. 1304,  $\frac{1}{2}$  pint—4-inch Spout, per dozen - - - - \$6 00  
No. 1504, 1 pint—4-inch Spout, per dozen - - - - 8 00

Fig. 5842



Fig. 5848

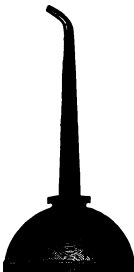
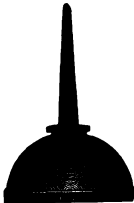


Fig. 5850

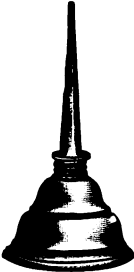


HARDWARE

STEEL COPPERIZED OILERS

|                            |        |        |      |
|----------------------------|--------|--------|------|
| Size - - - - -             | No.    | 13     | 14   |
| Length of nozzle - - - - - | inches | 3      | 9    |
| Per dozen - - - - -        |        | \$5 50 | 6 50 |

Fig. 5840



BRASS AND ZINC OILERS

| Size - - - - -      | No.   | BRASS  |      | ZINC  |      |      |      |
|---------------------|-------|--------|------|-------|------|------|------|
|                     |       | 2      | 3    | 2     | 3    | 4    | 5    |
| Capacity - - - - -  | gills | 1 1/2  | 2    | 1 1/2 | 2    | -    | -    |
| Per dozen - - - - - |       | \$3 50 | 4 00 | 2 00  | 2 25 | 2 75 | 3 50 |
| Tubes - - - - -     | each  | 10     | 10   | 10    | 10   | -    | -    |

LONG SPOUT BRAZED STEEL OILER—Fig. 5846

|                     |         |             |         |          |
|---------------------|---------|-------------|---------|----------|
| Capacity - - - - -  | 1 pint  | 1 1/2 pints | 1 quart | 2 quarts |
| Per dozen - - - - - | \$12 00 | 12 00       | 13 00   | 15 00    |

Fig. 5846



Fig. 5847

STEEL COPPERIZED RAILROAD OILER—Fig. 5847

|                         |           |         |
|-------------------------|-----------|---------|
| No. - - - - -           | 10        | 11      |
| Capacity - - - - -      | 1 pint    | 1 quart |
| Length nozzle - - - - - | 12 inches | 18      |
| Per dozen - - - - -     | \$14 00   | 18 00   |

BRAZED STEEL PYRAMID TORCH

Fig. 5831

|                                                    |                   |
|----------------------------------------------------|-------------------|
| No. 80, 1/2 pint, 1 burner - - - - -               | per dozen, \$7 00 |
| No. 81, 1 pint, 1 burner - - - - -                 | per dozen, 9 00   |
| No. 82, 1 quart, 1 burner - - - - -                | per dozen, 10 00  |
| No. 83, 1 quart, 2 burners - - - - -               | per dozen, 11 00  |
| No. 84, 2 quarts, 1 burner - - - - -               | per dozen, 12 00  |
| No. 85, 2 quarts, 2 burners - - - - -              | per dozen, 13 00  |
| No. 86, 4 quarts, 2 burners - - - - -              | per dozen, 15 00  |
| No. 87, 4 quarts, 3 or 4 burners, per dozen, 18 00 |                   |

BRAZED STEEL BROAD TOP TORCHES

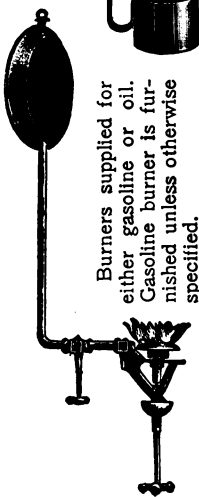
|                                       |                   |
|---------------------------------------|-------------------|
| No. 90, 1 pint, 1 burner - - - - -    | per dozen, \$9 00 |
| No. 91, 1 quart, 1 burner - - - - -   | per dozen, 10 00  |
| No. 92, 1 quart, 2 burners - - - - -  | per dozen, 11 00  |
| No. 93, 2 quarts, 1 burner - - - - -  | per dozen, 12 00  |
| No. 94, 2 quarts, 2 burners - - - - - | per dozen, 13 00  |

GASOLINE OR OIL TORCH—Fig. 5833

|                          |        |
|--------------------------|--------|
| Price complete - - - - - | \$1 50 |
| Burner only - - - - -    | 1 00   |
| Valve only - - - - -     | 50     |



Fig. 5833



Burners supplied for  
either gasoline or oil.  
Gasoline burner is fur-  
nished unless otherwise  
specified.

## HARDWARE

Fig. 5830



### BRAZEN STEEL TALLOW POT

No. 40,  $\frac{1}{2}$  gallon capacity - - - - - per dozen, \$15 00  
 No. 41, 1 gallon capacity - - - - - per dozen, 18 00

### DINNER

Fig. 5864



### PAILS

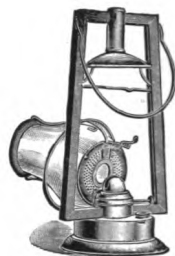
Dinner, 5 quarts, fig. 5864 - - - - - per dozen, \$8 00  
 Dinner, 6 quarts, fig. 5864 - - - - - per dozen, 9 50  
 Dinner, 6 quarts, square, fig. 5864 - - - - - per dozen, 9 00  
 Wooden, 3 hoops, not illustrated - - - - - per dozen, 3 00  
 Wooden, 2 hoops, not illustrated - - - - - per dozen, 2 75  
 Wooden, "Buckeye" barn, not illustrated - - - - - per dozen, 9 00

Fig. 5855



### LANTERNS

Tubular No. 0, with square lift - - per dozen, \$13 00  
 Globes - - - - - per dozen, 1 00  
 Burners - - - - - per dozen, 90  
 Wicks - - - - - per dozen, 05



### REGULAR

Fig. 5860



### OIL CANS

$\frac{1}{2}$  gallon, tin, fig. 5860 - - - - - per dozen, \$3 00  
 1 gallon, tin, fig. 5860 - - - - - per dozen, 4 00  
 1 gallon, jacket, fig. 5862 - - - - - each, 40  
 2 gallons, jacket, fig. 5862 - - - - - each, 55  
 3 gallons, jacket, fig. 5862 - - - - - each, 70  
 5 gallons, jacket, fig. 5862 - - - - - each, 85  
 10 gallons, jacket, fig. 5862 - - - - - each, 1 50

### WOOD JACKET

Fig. 5862



### IRON ROOFING AND SIDING

Either plain or corrugated

### ROOF RIDGE CAP

Fig. 5881

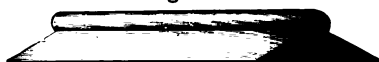


### BEADED CEILING

Not illustrated

### ROOF RIDGE ROLL

Fig. 5883



Prices quoted on specifications

A sketch should accompany each order for siding and roofing, showing height, length and width of building; also projection and pitch of roof.

**ASPHALTUM**

Per gallon - - - - - \$0 75  
 Half or full barrels at market rate.

**BORAX**

Small quantities - - - - - per pound, \$0 15  
 By the barrel, special.

**BROOMS**

Not illustrated

Common, all corn - - - - - per dozen, \$4 00  
 No. 4, factory, all corn - - - - - per dozen, 4 50  
 No. 7, factory, all corn - - - - - per dozen, 5 25  
 No. 4, rattan mixed - - - - - per dozen, 6 00  
 No. 8, rattan mixed - - - - - per dozen, 7 00

**COAL**

Blacksmith - - - - - per 100 pounds, \$0 35

**EMERY**

In 10-pound tin cans, 15 cents per pound

| Quantity - - - - -                        | Ream    | Quire | Sheet            |
|-------------------------------------------|---------|-------|------------------|
| Cloth, FF to No. $\frac{1}{2}$ - - - - -  | \$24 00 | 1 25  | 06               |
| Paper, Nos. 00 to $\frac{1}{2}$ - - - - - | 9 00    | 50    | 02 $\frac{1}{2}$ |
| Paper, No. 1 to 2 - - - - -               | 12 00   | 60    | 03               |

**FLAX SEED**

Per pound - - - - - \$0 10

**IRON**

Merchant, flat, round and square, regular sizes - - - - - per pound, -----  
 Norway riveting,  $\frac{1}{2}$ -inch diameter - - - - - per pound, \$0 10  
 Cut to order, 3 cents per pound extra.

**LEAD**

Red, in 1-pound cans, in oil - - \$0 15  
 White, in 1-pound cans, in oil - - 14  
 Sheet by the pound - - - - - 10

**LAMP WICK**

By the bale - - - - - per pound, \$0 25  
 Less than bale - - - - - per pound, 30  
 Ball - - - - - per ball, 05

**MARLINE**

Per pound - - - - - \$0 20

**OAKUM**

By the pound - - - - - \$0 12

**OIL**

Lard, winter strained - - - - - per gallon, \$1 00  
 Winter strained lard, barrel rates subject to market quotations.  
 Cylinder and engine oils, barrel rates subject to market quotations.

**PAPER**

Hardware, common - - - - - per pound, \$0 08  
 Building - - - - - per pound, 04  
 Best Manila - - - - - per pound, 10  
 Tarred - - - - - per pound, 04

**PITCH**

Per pound - - - - - \$0 03

**PLUMBAGO**

Per pound - - - - - \$0 30

**SAND PAPER**

|                                           | Per ream | Per quire |
|-------------------------------------------|----------|-----------|
| Flint, Nos. 00 to $\frac{1}{2}$ - - - - - | \$6 50   | 30        |
| Flint, No. 1 - - - - -                    | 7 00     | 30        |
| Flint, No. $1\frac{1}{2}$ - - - - -       | 7 50     | 35        |
| Flint, No. 2 - - - - -                    | 8 00     | 35        |

Per sheet, 3 cents.

STEEL

Not illustrated

|                                                       |           |                   |
|-------------------------------------------------------|-----------|-------------------|
| Small sizes, octagon, square and round, by the bar    | - - - - - | per pound, \$0 12 |
| Small sizes, octagon, square and round, less than bar | - - - - - | per pound, 15     |
| Large sizes for oil well tools                        | - - - - - | per pound, 15     |

TALLOW

|                      |           |                   |
|----------------------|-----------|-------------------|
| In 10-pound packages | - - - - - | per pound, \$0 10 |
|----------------------|-----------|-------------------|

TWINE

|          |           |                   |
|----------|-----------|-------------------|
| Seed bag | - - - - - | per pound, \$0 25 |
| Wrapping | - - - - - | per pound, 35     |

WASTE

|              |           |                   |
|--------------|-----------|-------------------|
| White, No. 1 | - - - - - | per pound, \$0 12 |
|--------------|-----------|-------------------|

WIRE

| Number              |           | 0 to 9    | 10                | 12  |
|---------------------|-----------|-----------|-------------------|-----|
| Iron, black         | per pound | \$0 10    | 11                | 11½ |
| Iron, galvanized    | per pound | 12        | 13                | 14  |
| Copper, No. 0 to 20 | - - - - - | - - - - - | per pound, \$0 50 |     |
| Torpedo, No. 16     | - - - - - | - - - - - | per pound, 15     |     |
| Torpedo, No. 20     | - - - - - | - - - - - | per pound, 20     |     |

GALVANIZED WIRE STRAND

For smoke stack guys, electric light plants, street railways, signal cord, fencing and other purposes.

| 7 wires No.                           | 8             | 10             | 11            | 12             | 15            | 17            | 18            | 20            | 21            |
|---------------------------------------|---------------|----------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|
| Approximate diameter - - - inch       | $\frac{1}{2}$ | $\frac{7}{16}$ | $\frac{3}{8}$ | $\frac{5}{16}$ | $\frac{1}{2}$ | $\frac{3}{8}$ | $\frac{5}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ |
| Approximate weight per 100 ft. - lbs. | 52            | 40             | 30            | 22             | 13            | 8             | 5             | 3½            | 2½            |
| Approximate strength in pounds        | 8,320         | 6,000          | 4,700         | 3,300          | 1,750         | 1,000         | 700           | 375           | 320           |
| Price per 100 feet                    | \$4 50        | 3 75           | 2 75          | 2 25           | 1 75          | 1 25          | 1 15          | 1 00          | 80            |

For special galvanized wire strand for connecting pumping wells, see page 258.

PACKING

ASBESTOS—MILL BOARD OR FLAT

In sheets 40 x 40 and 42 x 44 inches, from  $\frac{1}{8}$  to  $\frac{1}{2}$  inch thick.

Approximate weight per sheet 40 x 40 inches:

| Thickness - - - - - inch | $\frac{1}{32}$ | $\frac{1}{16}$ | $\frac{3}{32}$ | $\frac{1}{8}$ | $\frac{3}{16}$ | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ |
|--------------------------|----------------|----------------|----------------|---------------|----------------|---------------|---------------|---------------|
| Weight - - - - - lbs.    | 1½             | 3½             | 5½             | 8             | 10½            | 14            | 21            | 28            |
| Per pound                | - - - - -      | - - - - -      | - - - - -      | - - - - -     | - - - - -      | - - - - -     | - - - - -     | \$0 20        |

ASBESTOS PISTON ROD

|                                                                                                             |           |                   |
|-------------------------------------------------------------------------------------------------------------|-----------|-------------------|
| On reels containing 10, 15, 25 and 50 pounds each. Regular sizes from $\frac{1}{4}$ to 2 inches in diameter | - - - - - | per pound, \$0 50 |
|-------------------------------------------------------------------------------------------------------------|-----------|-------------------|

ASBESTOS WICK

|                                                                              |           |                   |
|------------------------------------------------------------------------------|-----------|-------------------|
| In $\frac{1}{4}$ , $\frac{1}{2}$ and 1 pound balls and 5 and 10 pound spools | - - - - - | per pound, \$0 50 |
|------------------------------------------------------------------------------|-----------|-------------------|

ITALIAN FLAX

|                                              |           |                   |
|----------------------------------------------|-----------|-------------------|
| Coils of 25 or 50 pounds, or 100-pound reels | - - - - - | per pound, \$0 30 |
| Less than a coil                             | - - - - - | per pound, 40     |

**PACKING****RUBBER****MANUFACTURERS' LIST**

Cloth insertion. Cloth on one or both sides

| Thickness, inches | 1-ply, per pound | 2-ply, per pound | 3-ply, per pound | 4-ply, per pound |
|-------------------|------------------|------------------|------------------|------------------|
| $\frac{1}{8}$     | \$0 70           | --               | --               | --               |
| $\frac{1}{4}$     | 65               | --               | --               | --               |
| $\frac{3}{8}$     | 60               | 63               | 66               | --               |
| $\frac{1}{2}$     | 55               | 58               | 61               | --               |
| $\frac{3}{4}$     | 55               | 55               | 58               | 61               |
| $\frac{7}{8}$     | 55               | 55               | 55               | 58               |
| 1                 | 55               | 55               | 55               | 55               |

One ply of cloth to every  $\frac{1}{8}$  inch thickness.

Three cents per pound additional will be charged for each extra ply of cloth. Each cloth, whether insertion or on outside, to count as one ply.

All cloth insertion or plain packing is one yard wide and any length desired.

|                                                                         |                   |
|-------------------------------------------------------------------------|-------------------|
| All sizes at retail                                                     | per pound, \$0 35 |
| Rubber piston, round and square, $\frac{1}{4}$ to $1\frac{1}{2}$ inches | per pound, 85     |
| Steam pump piston, $\frac{1}{4}$ to $1\frac{1}{2}$ inches               | per pound, 1 00   |
| Soapstone                                                               | per pound, 15     |
| Usudurian, sheet                                                        | per pound, 80     |
| Usudurian gaskets, rings, etc.                                          | per pound, 95     |
| Spiral packing, Garlock's                                               | per pound, 1 20   |

Garlock's packing is made 12 feet long and in sizes from  $\frac{3}{8}$  inch to 2 inches. Each strip is coiled in a box made especially for it, so that there is no chance of its getting impregnated with dust or grit.

**APPROXIMATE WEIGHT**

The following is a close estimate of the weight of a box of Carlock's spiral packing. Each box contains 12 feet, and we furnish only full boxes. Larger sizes to order.

| Size - inches | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{3}{4}$  | $\frac{7}{8}$  | 1              | $1\frac{1}{8}$ | $\frac{5}{4}$  | $1\frac{3}{4}$ | $\frac{7}{4}$  | $1\frac{5}{8}$  | 2              |
|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|
| Weight - lbs. | $\frac{1}{2}$ | $\frac{3}{4}$ | 1             | $1\frac{1}{2}$ | $1\frac{3}{4}$ | $2\frac{1}{8}$ | $2\frac{7}{8}$ | $3\frac{3}{8}$ | $4\frac{1}{4}$ | $5\frac{3}{4}$ | 6 $\frac{3}{8}$ | $7\frac{1}{8}$ |

Square flax packing - - - - - per pound, \$0 85

This packing is made in sizes from  $\frac{1}{4}$  to 3 inches or over. Put up in 5 and 10 pound boxes.

**GASKETS****JOHNSON'S METALLIC**

For malleable iron unions

| Size - - - - - inches | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1  | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2    |
|-----------------------|---------------|---------------|---------------|---------------|----|----------------|----------------|------|
| Per 100 - - - - -     | \$0 50        | 50            | 60            | 70            | 80 | 1 00           | 1 20           | 1 50 |

**MOULDED RUBBER**

For malleable iron unions

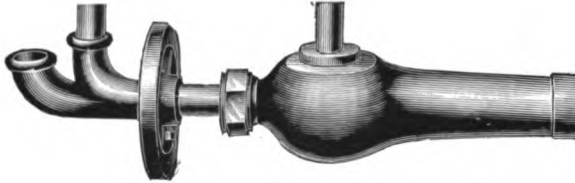
| Size - - - - - inches | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1  | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2    | $2\frac{1}{2}$ |
|-----------------------|---------------|---------------|---------------|---------------|----|----------------|----------------|------|----------------|
| Per 100 - - - - -     | \$0 55        | 60            | 65            | 75            | 80 | 1 10           | 1 20           | 1 50 | 2 70           |

Plumbers who have bothered with cutting union washers of sheet packing will appreciate these goods.

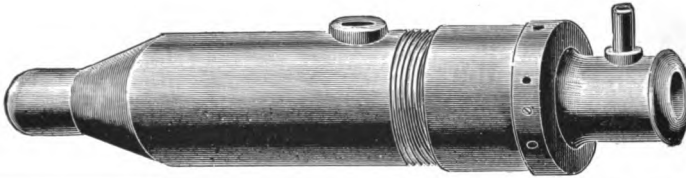
**MOULDED RUBBER**

For flange unions

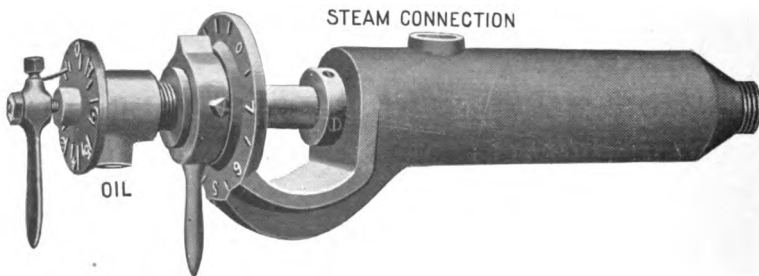
| Size - - - - - inches | 1      | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2  | $2\frac{1}{2}$ | 3  | $3\frac{1}{2}$ | 4  | $4\frac{1}{2}$ | 5  | 6  |
|-----------------------|--------|----------------|----------------|----|----------------|----|----------------|----|----------------|----|----|
| Each - - - - -        | \$0 10 | 12             | 15             | 20 | 25             | 30 | 35             | 38 | 40             | 45 | 50 |

**OIL BURNERS****PARSON'S****Fig. 3210**

Complete - - - - - \$15 00

**REID'S****Fig. 3214**

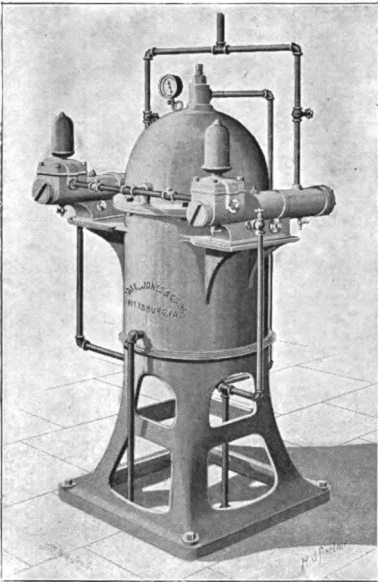
|                                    | Weight,<br>lbs. | Price   |
|------------------------------------|-----------------|---------|
| No. 2, for boiler - - - - -        | 15              | \$15 00 |
| No. 3, for burning brick - - - - - | 5               | 13 00   |

**KIRKWOOD OIL ATOMIZER OR BURNER****Fig. 3215-A****THE KIRKWOOD PATENT OIL ATOMIZER OR BURNER**

1. It can be operated with either steam or compressed air.
2. It does not clog.
3. It is easily cleaned.
4. The supply of oil and steam is regulated at the point of combustion rather than far back in the burners, as those of other manufacturers.
5. There is a graduated scale for both the steam and oil supply. This is a feature possessed by no other burner and is a great assistance to the firemen in charge of the boilers.

Price - - - - - \$20 00

Fig. 3215-B



No. 1—Duplicate pumps

## KIRKWOOD DUPLICATE PUMPING AND HEATING SYSTEM

The Kirkwood pumping and heating system consists of a base or stand containing a chamber with a pipe coil, through which the oil is pumped, and is surrounded by exhaust steam from the pump. The upper part consists of a chamber, into which the oil goes from the pump on its way to the coil and automatic release valves, by which the excess of oil is returned to the storage tank without being heated.

The whole system is complete with gauge for indicating the pressure, all piping and connections. The system illustrated has duplicate pumps, separately connected, each one being capable of supplying the entire boiler plant in which it is installed, so that one pump only need be used at a time, giving, thereby, a duplicate system.

No. 1, with duplicate pumps - - - \$400 00

No. 0, with duplicate pumps - - - 200 00

No. 0, with single pump - - - 150 00

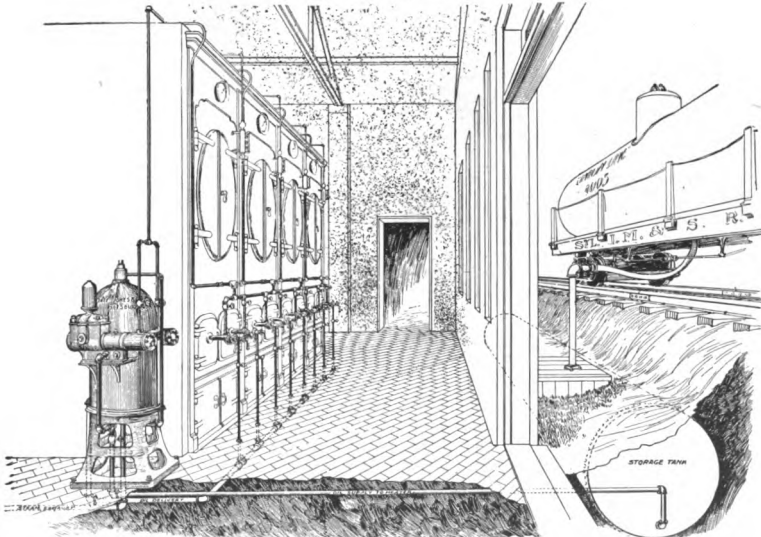
Davidson or Moore pumps furnished with this outfit unless pumps of other makes are specially ordered.

## BOILER PLANT EQUIPPED FOR BURNING OIL FUEL

COMPLETE INSTALLATIONS

GUARANTEED RESULTS

Fig. 3215-C



We illustrate above the general arrangement and necessary apparatus for using fuel oil under a battery of boilers. Local conditions, of course, vary this arrangement.

Prices for complete installations furnished upon application.

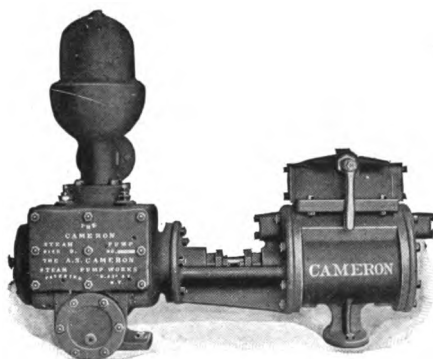




# THE CAMERON REGULAR PATTERN STEAM PUMP

FOR OIL, GAS OR WATER

Fig. 5460



The first seven sizes furnished with hand lever attachment when so desired

| Size number | Price with iron water cylinder and steel piston rod | Price with water cylinder lining, piston and piston rod of composition | Diameter of steam cylinder, inches | Diameter of water cylinder, inches | Stroke of piston, inches | Capacity per stroke, gallons | Ordinary speed per minute in strokes | Capacity at ordinary speed per minute, gallons | Steam pipe | Exhaust pipe | Suction pipe | Discharge pipe | Floor space, inches | Weight, lbs. |
|-------------|-----------------------------------------------------|------------------------------------------------------------------------|------------------------------------|------------------------------------|--------------------------|------------------------------|--------------------------------------|------------------------------------------------|------------|--------------|--------------|----------------|---------------------|--------------|
| 0           | \$80 00                                             | \$85 00                                                                | 3½                                 | 2                                  | 4                        | .054                         | 150                                  | 8                                              | 1½         | 1½           | 1            | 1              | 32 x 9              | 135          |
| 1           | 120 00                                              | 125 00                                                                 | 4                                  | 2                                  | 6                        | .081                         | 150                                  | 12                                             | 1½         | 1½           | 1            | 1              | 40 x 10             | 210          |
| 2           | 140 00                                              | 150 00                                                                 | 5                                  | 2½                                 | 6                        | .12                          | 150                                  | 18                                             | 1½         | 1½           | 1½           | 1½             | 40 x 11             | 254          |
| 3           | 165 00                                              | 175 00                                                                 | 6                                  | 3                                  | 7                        | .21                          | 133                                  | 28                                             | 1          | 2            | 1½           | 1½             | 47 x 13             | 418          |
| 3a          | 185 00                                              | 200 00                                                                 | 6                                  | 3½                                 | 7                        | .29                          | 133                                  | 38                                             | 1          | 2½           | 2            | 2              | 47 x 15             | 435          |
| 4           | 210 00                                              | 225 00                                                                 | 7                                  | 3½                                 | 7                        | .29                          | 133                                  | 38                                             | 1          | 2½           | 2            | 2              | 47 x 15             | 459          |
| 4a          | 235 00                                              | 250 00                                                                 | 7                                  | 4                                  | 7                        | .39                          | 133                                  | 50                                             | 1          | 2½           | 2            | 2              | 51 x 16             | 457          |
| 5           | 275 00                                              | 290 00                                                                 | 7                                  | 3½                                 | 12                       | .5                           | 100                                  | 50                                             | 1          | 1½           | 3            | 2½             | 58 x 17             | 820          |
| 5b          | 325 00                                              | 350 00                                                                 | 7                                  | 5                                  | 13                       | 1.10                         | 90                                   | 100                                            | 1          | 1½           | 4            | 3              | 63 x 20             | 1,117        |
| 6           | 325 00                                              | 340 00                                                                 | 8                                  | 4                                  | 12                       | .65                          | 100                                  | 65                                             | 1          | 1½           | 3            | 2½             | 58 x 18             | 864          |
| 6a          | 350 00                                              | 375 00                                                                 | 8                                  | 5                                  | 13                       | 1.10                         | 90                                   | 100                                            | 1          | 1½           | 4            | 3              | 63 x 20             | 1,160        |
| 7           | 375 00                                              | 400 00                                                                 | 10                                 | 5                                  | 13                       | 1.10                         | 90                                   | 100                                            | 1½         | 2            | 4            | 3              | 64 x 21             | 1,345        |
| 8           | 400 00                                              | 425 00                                                                 | 10                                 | 6                                  | 13                       | 1.59                         | 90                                   | 150                                            | 1½         | 2            | 4            | 3½             | 64 x 21             | 1,411        |
| 9           | 470 00                                              | 520 00                                                                 | 12                                 | 7                                  | 13                       | 2.16                         | 90                                   | 200                                            | 1½         | 2½           | 5            | 4              | 66 x 24             | 1,928        |
| 10a         | 540 00                                              | 575 00                                                                 | 14                                 | 8                                  | 13                       | 2.83                         | 90                                   | 261                                            | 2          | 3            | 5            | 5              | 73 x 26             | 2,548        |
| 10          | -----                                               | -----                                                                  | 14                                 | 9                                  | 18                       | 4.96                         | 67                                   | 330                                            | 2          | 3            | 6            | 5              | 81 x 30             | 3,126        |
| 11          | -----                                               | -----                                                                  | 16                                 | 10½                                | 18                       | 6.75                         | 67                                   | 450                                            | 2½         | 4            | 8            | 6              | 90 x 37             | 4,827        |
| 12          | -----                                               | -----                                                                  | 18                                 | 12                                 | 20                       | 9.80                         | 60                                   | 587                                            | 3          | 4            | 10           | 8              | 103 x 41            | 6,360        |

# PARTS FOR CAMERON REGULAR STEAM PUMPS

[illegible]

## PARTS FOR CAMERON REGULAR STEAM PUMPS

| Size No. of Pump.....                                   | 0     | 1     | 2     | 3      | 3 a    | 4      | 4 a    | 5      | 5 b    | 6      | 6 a    | 7      | 8      | 9      | 10     | 10 a   | 11     | 12     |
|---------------------------------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Plugs with set screws, 2 to set.....                    |       |       |       |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Plugs with set screws, 8 to set.....                    |       |       |       |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Plugs without set screws, 2 to set.....                 |       |       |       |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Conical Valve Springs, per set of 4.....                | 30.00 | .00   | .00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | \$2.00 | 1.00   | 2.50   | 2.50   | 2.50   | 2.50   | 3.00   | 2.50   | 3.00   | 3.00   |
| Water Piston Complete, brass.....                       | 2.20  | 2.00  | 3.00  | 4.00   | 5.00   | 5.00   | 7.00   | 6.50   | 2.50   | 2.50   | 2.50   | 2.50   | 2.50   | 3.00   | 5.00   | 3.00   | 10.00  |        |
| Water Piston Head.....                                  | 1.40  | 1.70  | 2.00  | 2.50   | 3.00   | 3.00   | 4.50   | 4.00   | 1.00   | 5.00   | 10.50  | 10.50  | 13.00  | 13.00  | 23.00  | 23.00  | 36.00  | 73.20  |
| Water Piston Follower.....                              | .80   | .90   | 1.00  | 1.50   | 2.00   | 2.00   | 2.50   | 2.50   | 3.50   | 2.50   | 3.50   | 3.50   | 4.50   | 5.00   | 10.00  | 8.00   | 12.00  | 18.00  |
| Water Piston Iron Head.....                             |       |       |       |        |        |        |        |        |        |        |        |        |        |        | 11.00  | 9.00   | 14.00  | 18.00  |
| Water Piston and Brass Follower complete.....           |       |       |       |        |        |        |        |        |        |        |        |        |        |        | 26.00  | 23.00  | 33.20  | 46.00  |
| Water Piston Bolts.....                                 |       |       |       |        | .60    | .60    | .60    | .80    | 1.00   | .80    | 1.00   | 1.00   | 1.00   | 1.00   | 1.50   | 1.25   | 1.25   | 1.60   |
| Water Piston Nuts.....                                  |       |       |       |        |        |        |        |        | .30    | .30    | .30    | .30    | .30    | .30    | .30    | .30    | .30    | .30    |
| Steel Set Screws for valve stem plugs.....              |       |       |       |        |        |        |        |        | .30    | .30    | .30    | .30    | .30    | .30    | .30    | .30    | .30    | .30    |
| Steam Cylinder, bored, planed, drilled, and tapped..... | 14.00 | 20.00 | 25.50 | 34.00  | 34.00  | 40.00  | 40.00  | 60.00  | 60.00  | 70.00  | 70.00  | 90.00  | 90.00  | 110.00 | 40.00  | 30.00  | 174.00 | 220.00 |
| Steam Cylinder complete with steam chest.....           | 30.00 | 45.00 | 50.00 | 70.00  | 70.00  | 75.00  | 80.00  | 104.00 | 104.00 | 116.00 | 116.00 | 152.00 | 152.00 | 174.00 | 220.00 | 220.00 | 356.00 | 432.00 |
| Steam Cylinder complete with steam chest and cover..... | 40.00 | 55.00 | 64.00 | 84.00  | 84.00  | 92.00  | 92.00  | 128.00 | 128.00 | 140.00 | 140.00 | 180.00 | 180.00 | 210.00 | 250.00 | 250.00 | 406.00 | 578.00 |
| Steam Cylinder complete with steam chest and body.....  | 60.00 | 80.00 | 92.00 | 130.00 | 130.00 | 140.00 | 140.00 | 180.00 | 180.00 | 196.00 | 196.00 | 250.00 | 250.00 | 300.00 | 350.00 | 350.00 | 550.00 | 740.00 |
| Extra 1 Flange.....                                     | 9.00  | 14.00 | 14.00 | 21.00  | 21.00  | 21.00  | 21.00  | 23.50  | 23.50  | 23.50  | 23.50  | 32.00  | 32.00  | 32.00  | 40.00  | 40.00  | 45.00  | 4.50   |
| Steam Chest, bored, planed, drilled, and tapped.....    | 15.00 | 24.00 | 24.00 | 34.00  | 34.00  | 34.00  | 34.00  | 40.00  | 40.00  | 40.00  | 40.00  | 55.00  | 55.00  | 55.00  | 66.00  | 66.00  | 76.00  | 76.00  |
| Steam Chest complete, without slide valve.....          | 16.50 | 25.00 | 25.00 | 35.00  | 35.00  | 35.00  | 35.00  | 45.00  | 45.00  | 45.00  | 45.00  | 59.50  | 59.50  | 59.50  | 72.50  | 72.50  | 83.50  | 84.00  |
| Steam Chest complete, with slide valve.....             | 18.00 | 26.00 | 26.00 | 36.00  | 36.00  | 36.00  | 36.00  | 45.00  | 45.00  | 45.00  | 45.00  | 60.00  | 60.00  | 60.00  | 73.00  | 73.00  | 84.00  | 84.00  |
| Steam Chest Plunger—rough.....                          | 2.50  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00   | 1.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.74   | 2.74   | 4.00   | 4.00   | 5.00   | 5.00   |
| Steam Chest Plunger—finished.....                       | 2.50  | 1.00  | 1.00  | 1.00   | 1.00   | 1.00   | 1.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.74   | 2.74   | 4.00   | 4.00   | 5.00   | 5.00   |
| Steam Chest Cover.....                                  | 1.40  | .60   | .60   | 1.00   | 1.00   | 1.00   | 1.00   | 1.50   | 1.50   | 1.50   | 1.50   | 2.00   | 2.00   | 2.00   | 2.50   | 2.50   | 2.50   | 2.50   |
| Steam Chest Stuffing Box complete.....                  | 1.50  | 2.00  | 2.00  | 2.50   | 2.50   | 2.50   | 2.50   | 3.00   | 3.00   | 3.00   | 3.00   | 3.50   | 3.50   | 3.50   | 4.00   | 4.00   | 4.00   | 4.00   |
| Steam Chest Stuffing Box Bottom.....                    | 1.00  | 1.30  | 1.30  | 1.50   | 1.50   | 1.50   | 1.50   | 1.80   | 1.80   | 1.80   | 1.80   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Steam Chest Stuffing Box Cap.....                       | .50   | .60   | .60   | 1.00   | 1.00   | 1.00   | 1.00   | 1.50   | 1.50   | 1.50   | 1.50   | 1.50   | 1.50   | 1.50   | 1.50   | 1.50   | 1.50   | 1.50   |
| Steam Chest Crank.....                                  | .60   | .80   | .80   | 1.50   | 1.50   | 1.50   | 1.50   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Steam Chest Crank Handle.....                           | .20   | .20   | .20   | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    |
| Steam Chest Crank Nuts.....                             | .20   | .20   | .20   | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    | .24    |
| Steam Chest Crank Handle and Nut complete.....          | 1.30  | 1.50  | 1.50  | 2.74   | 2.74   | 2.74   | 2.74   | 3.00   | 3.00   | 3.00   | 3.00   | 3.00   | 3.00   | 3.00   | 3.00   | 3.00   | 3.00   | 3.00   |
| Slide Valve.....                                        | 1.20  | 1.60  | 1.60  | 2.50   | 2.50   | 2.50   | 2.50   | 3.00   | 3.00   | 3.00   | 3.00   | 4.00   | 4.00   | 4.00   | 4.50   | 4.50   | 5.00   | 5.00   |
| Body Piece complete.....                                | 20.00 | 24.00 | 28.00 | 40.00  | 40.00  | 44.00  | 44.00  | 50.00  | 50.00  | 54.00  | 54.00  | 70.00  | 70.00  | 84.00  | 110.00 | 110.00 | 130.00 | 160.00 |

## PARTS FOR CAMERON REGULAR STEAM PUMPS

| Size No. of Pump.....                                  | 0       | 1     | 2     | 3     | 3 a   | 4     | 4 a   | 5     | 5 b   | 6     | 6 a   | 7     | 8     | 9     | 10    | 10 a  | 11    | 12     |
|--------------------------------------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Body Piece Stuffing Box complete..... (2) each         | \$ 2.00 | 2.60  | 2.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Body Piece Stuffing Box bottom..... (2) each           | 1.00    | 1.20  | 1.20  | 2.50  | 2.50  | 2.50  | 2.50  | 2.50  | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Body Piece Stuffing Box cap..... (2) each              | .70     | 1.00  | 1.00  | 1.50  | 1.50  | 1.50  | 1.50  | 1.50  | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Body Piece Stuffing Box thimble..... (2) each          | .30     | .40   | .40   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Body Piece Stuffing Box gland..... (2) each            | .....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Body Piece Stuffing Box gland, bolts and nuts (4) each | .....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Body Piece without fittings..... (2) each              | 11.00   | 14.00 | 16.00 | 22.00 | 22.00 | 26.00 | 26.00 | 34.00 | 36.00 | 38.00 | 38.00 | 48.00 | 48.00 | 60.00 | 80.00 | 80.00 | 82.00 | 120.00 |
| Steam Cylinder Cover without fittings.....             | 9.00    | 11.00 | 12.00 | 14.00 | 14.00 | 16.00 | 16.00 | 22.00 | 22.00 | 23.00 | 23.00 | 30.00 | 30.00 | 34.00 | 44.00 | 44.00 | 50.00 | 60.00  |
| Steam Cylinder Cover complete.....                     | 5.00    | 6.00  | 7.00  | 8.50  | 8.50  | 10.50 | 10.50 | 15.00 | 15.00 | 16.00 | 16.00 | 20.00 | 20.00 | 24.00 | 30.00 | 30.00 | 34.00 | 40.00  |
| Hand Gear Lever.....                                   | 2.00    | 2.00  | 2.00  | 2.50  | 2.50  | 2.50  | 2.50  | 2.50  | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Reversing Valve..... (2) each                          | 1.50    | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  | 2.50  | 2.50  | 2.50  | 2.50  | 3.50  | 3.50  | 3.50  | 4.50  | 4.50  | 4.50  | 6.00   |
| Reversing Valve bushing..... (2) each                  | 1.74    | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  | 2.00  | 3.50  | 3.50  | 3.50  | 3.50  | 4.50  | 4.50  | 4.50  | 6.00  | 6.00  | 6.00  | 7.50   |
| Reversing Valve plug..... (2) each                     | .60     | .80   | .80   | .80   | .80   | .80   | .80   | 1.00  | 1.00  | 1.00  | 1.00  | 1.24  | 1.24  | 1.24  | 1.50  | 1.50  | 1.50  | 2.00   |
| Steam Piston ring and spring pattern complete.....     | 6.50    | 8.00  | 10.00 | 12.00 | 12.00 | 14.00 | 14.00 | 20.00 | 20.00 | 24.00 | 24.00 | 32.00 | 32.00 | 40.00 | 54.00 | 54.00 | 64.00 | 84.00  |
| Steam Piston head.....                                 | 2.00    | 2.50  | 3.20  | 4.00  | 4.00  | 4.50  | 4.50  | 5.00  | 5.00  | 5.50  | 5.50  | 7.50  | 7.50  | 9.50  | 10.00 | 10.00 | 12.00 | 16.00  |
| Steam Piston follower.....                             | 2.00    | 2.50  | 3.20  | 4.00  | 4.00  | 4.50  | 4.50  | 5.00  | 5.00  | 5.50  | 5.50  | 7.50  | 7.50  | 9.50  | 10.00 | 10.00 | 12.00 | 16.00  |
| Steam Piston ring with wedge and spring.....           | 2.40    | 3.00  | 3.50  | 4.00  | 4.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.50  | 5.50  | 7.50  | 7.50  | 9.50  | 10.00 | 10.00 | 12.00 | 16.00  |
| Steam Piston ring only.....                            | 1.60    | 2.00  | 2.50  | 3.00  | 3.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.50  | 4.50  | 5.50  | 5.50  | 6.00  | 8.00  | 8.00  | 9.00  | 12.50  |
| Steam Piston ring wedge.....                           | .40     | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50    |
| Steam Piston ring spring.....                          | .40     | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50    |
| Steam Piston nut.....                                  | .40     | .40   | .40   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50   | .50    |
| Steam Piston bull ring pattern, complete.....          | .....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Steam Piston head.....                                 | .....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Steam Piston follower.....                             | .....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Steam Piston bull ring.....                            | .....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Steam Piston Packing ring.....                         | .....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Steam Piston nut..... each                             | .....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .....  |
| Brass Piston Rod, with nuts.....                       | 4.40    | 6.40  | 6.40  | 10.10 | 10.10 | 10.10 | 10.10 | 16.30 | 17.50 | 16.30 | 17.50 | 28.60 | 28.60 | 34.70 | 49.50 | 48.00 | 69.00 | 85.00  |
| Brass Piston Rod, without nuts.....                    | 4.00    | 6.00  | 6.00  | 9.00  | 9.00  | 9.00  | 9.00  | 15.00 | 16.00 | 15.00 | 16.00 | 26.00 | 26.00 | 32.00 | 44.00 | 42.00 | 60.00 | 76.00  |
| Steel Piston Rod, with nuts.....                       | 3.40    | 4.40  | 4.40  | 6.10  | 6.10  | 6.10  | 6.10  | 8.30  | 9.50  | 8.30  | 9.50  | 13.60 | 13.60 | 16.70 | 23.50 | 25.00 | 50.00 | 35.00  |
| Steel Piston Rod, without nuts.....                    | 3.00    | 4.00  | 4.00  | 5.00  | 5.00  | 5.00  | 5.00  | 7.00  | 8.00  | 7.00  | 8.00  | 11.00 | 11.00 | 14.00 | 18.00 | 17.00 | 22.00 | 26.00  |

## THE CAMERON BOILER FEED STEAM PUMP

### PISTON PATTERN

Not illustrated

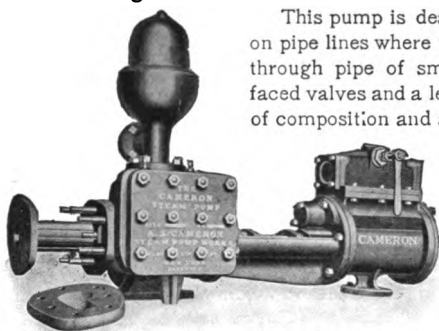
The main difficulty met with in fixing on the proper size of pump to recommend is that the horse power of the boiler for which the pump is required, is about all the information furnished. The expression "horse power" as applied to boilers, is a very indefinite term; what should be given, if possible, is the quantity of feed water required, and a pump which will supply this quantity at about one-half its rated capacity at ordinary speed will be right for cold water, and say one-third speed for hot water.

In feeding hot water the pump should be placed below the source of supply. The first six sizes furnished with hand-lever attachment when so desired.

| Size number | Price with iron water cylinder and steel piston rod | Price with water cylinder lining, piston and piston rod of composition | Diameter of steam cylinder, inches | Diameter of water cylinder, inches | Stroke of piston, inches | Capacity at ordinary speed per minute, gallons | Boilers in horse power they will supply at $\frac{1}{2}$ or ordinary speed, based on 30 lbs. of water per horse power per hour | Steam pipe      | Exhaust pipe    | Suction pipe    | Discharge pipe  | Floor space, inches | Weight, lbs. |
|-------------|-----------------------------------------------------|------------------------------------------------------------------------|------------------------------------|------------------------------------|--------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|---------------------|--------------|
| 0           | \$80 00                                             | \$85 00                                                                | 3 $\frac{1}{2}$                    | 2                                  | 4                        | 8                                              | 40                                                                                                                             | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 1               | 32 x 9              | 136          |
| 1           | 120 00                                              | 125 00                                                                 | 4                                  | 2                                  | 6                        | 12                                             | 60                                                                                                                             | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 1               | 40 x 10             | 210          |
| 2           | 140 00                                              | 150 00                                                                 | 5                                  | 2 $\frac{1}{2}$                    | 6                        | 18                                             | 90                                                                                                                             | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 40 x 11             | 254          |
| 2a          | 150 00                                              | 165 00                                                                 | 5                                  | 3                                  | 7                        | 28                                             | 140                                                                                                                            | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 2               | 2               | 47 x 12             | 347          |
| 2b          | 160 00                                              | 170 00                                                                 | 5                                  | 3 $\frac{1}{2}$                    | 7                        | 38                                             | 190                                                                                                                            | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | 2 $\frac{1}{2}$ | 2               | 47 x 14             | 355          |
| 3b          | 210 00                                              | 225 00                                                                 | 6                                  | 4                                  | 7                        | 50                                             | 250                                                                                                                            | 1               | 1               | 2 $\frac{1}{2}$ | 2               | 47 x 14             | 422          |
| 3c          | 210 00                                              | 225 00                                                                 | 6                                  | 3 $\frac{1}{2}$                    | 12                       | 50                                             | 250                                                                                                                            | 1               | 1               | 3               | 2 $\frac{1}{2}$ | 58 x 17             | 520          |
| 3d          | 230 00                                              | 245 00                                                                 | 6                                  | 4                                  | 12                       | 65                                             | 325                                                                                                                            | 1               | 1               | 3               | 2 $\frac{1}{2}$ | 58 x 17             | 525          |
| 5a          | 280 00                                              | 310 00                                                                 | 7                                  | 4 $\frac{1}{2}$                    | 12                       | 80                                             | 400                                                                                                                            | 1               | 1               | 3               | 2 $\frac{1}{2}$ | 58 x 18             | 725          |
| 5b          | 325 00                                              | 350 00                                                                 | 7                                  | 5                                  | 13                       | 100                                            | 500                                                                                                                            | 1               | 1 $\frac{1}{2}$ | 4               | 3               | 63 x 20             | 1117         |
| --          | 375 00                                              | 400 00                                                                 | 8                                  | 6                                  | 13                       | 150                                            | 750                                                                                                                            | 1               | 1 $\frac{1}{2}$ | 4               | 3 $\frac{1}{2}$ | 64 x 21             | 1202         |
| --          | 425 00                                              | 465 00                                                                 | 9                                  | 7                                  | 13                       | 200                                            | 1000                                                                                                                           | 1               | 1 $\frac{1}{2}$ | 5               | 4               | 66 x 24             | 1680         |
| --          | 445 00                                              | 490 00                                                                 | 10                                 | 7                                  | 13                       | 200                                            | 1000                                                                                                                           | 1 $\frac{1}{2}$ | 2               | 5               | 4               | 66 x 24             | 1770         |
| --          | 500 00                                              | 530 00                                                                 | 12                                 | 8                                  | 13                       | 261                                            | 1300                                                                                                                           | 1 $\frac{1}{2}$ | 2 $\frac{1}{2}$ | 5               | 5               | 73 x 26             | 2010         |
| --          | -----                                               | -----                                                                  | 14                                 | 9                                  | 18                       | 330                                            | 1600                                                                                                                           | 2               | 3               | 6               | 5               | 81 x 30             | 3125         |
| --          | -----                                               | -----                                                                  | 14                                 | 10                                 | 18                       | 400                                            | 2000                                                                                                                           | 2               | 3               | 6               | 5               | 81 x 30             | 3300         |
| --          | -----                                               | -----                                                                  | 16                                 | 10 $\frac{1}{2}$                   | 18                       | 450                                            | 2300                                                                                                                           | 2 $\frac{1}{2}$ | 4               | 8               | 6               | 90 x 37             | 4827         |
| --          | -----                                               | -----                                                                  | 16                                 | 12                                 | 20                       | 587                                            | 3000                                                                                                                           | 2 $\frac{1}{2}$ | 4               | 10              | 8               | 103 x 41            | 5140         |

## THE CAMERON OIL LINE PUMP

Fig. 5462

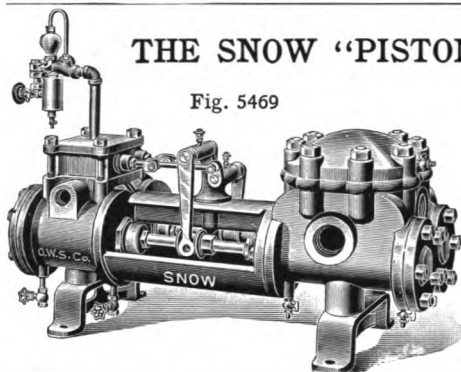


This pump is designed for handling crude or refined petroleum on pipe lines where the oil must be pumped a considerable distance through pipe of small diameter. It is fitted with either leather-faced valves and a leather cup piston for handling cold oil, or valves of composition and a hemp-packed piston for pumping oil at a high temperature. We supply this pump with a plain iron water cylinder, or fitted with a removable composition bushing of a peculiar form best adapted for this class of work. Bronze piston rods are supplied on all. The cut shows pump with composition bushing. This style of composition bushing is furnished on some sizes only, the bushings of other sizes being made without flange.

| Price, with iron oil cylinder and composition piston rod | Price, with piston rod and removable bushing of composition | Diameter of steam cylinder, inches | Diameter of oil cylinder, inches | Stroke of piston, inches | Capacity per stroke, gallons | Capacity at ordinary speed per minute, gallons | Steam pipe     | Exhaust pipe   | Suction pipe | Discharge pipe | Weight, lbs. |
|----------------------------------------------------------|-------------------------------------------------------------|------------------------------------|----------------------------------|--------------------------|------------------------------|------------------------------------------------|----------------|----------------|--------------|----------------|--------------|
| \$175 00                                                 | 195 00                                                      | 6                                  | 3                                | 7                        | .21                          | 28                                             | $\frac{3}{4}$  | 1              | 2            | $1\frac{1}{2}$ | 445          |
| 215 00                                                   | 235 00                                                      | 7                                  | 3                                | 7                        | .21                          | 28                                             | $\frac{3}{4}$  | 1              | 2            | $1\frac{1}{2}$ | 470          |
| 280 00                                                   | 300 00                                                      | 7                                  | $3\frac{1}{2}$                   | 12                       | .50                          | 50                                             | 1              | $1\frac{1}{2}$ | 3            | 2              | 820          |
| 330 00                                                   | 350 00                                                      | 8                                  | 3                                | 12                       | .36                          | 40                                             | 1              | $1\frac{1}{2}$ | 3            | 2              | 938          |
| 440 00                                                   | 475 00                                                      | 10                                 | 3                                | 13                       | .39                          | 40                                             | $1\frac{1}{2}$ | 2              | 3            | 2              | 1,745        |
| 440 00                                                   | 475 00                                                      | 10                                 | $3\frac{1}{2}$                   | 13                       | .54                          | 50                                             | $1\frac{1}{2}$ | 2              | 3            | 2              | 1,783        |
| 440 00                                                   | 475 00                                                      | 10                                 | 4                                | 13                       | .70                          | 65                                             | $1\frac{1}{2}$ | 2              | 3            | 2              | 1,760        |
| 440 00                                                   | 475 00                                                      | 10                                 | $4\frac{1}{2}$                   | 13                       | .90                          | 80                                             | $1\frac{1}{2}$ | 2              | 3            | 2              | 1,760        |
| 440 00                                                   | 475 00                                                      | 10                                 | 5                                | 13                       | 1.10                         | 100                                            | $1\frac{1}{2}$ | 2              | 4            | 3              | 1,345        |
| 515 00                                                   | 550 00                                                      | 12                                 | 3                                | 13                       | .39                          | 40                                             | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 3            | 2              | 1,890        |
| 515 00                                                   | 550 00                                                      | 12                                 | $3\frac{1}{2}$                   | 13                       | .54                          | 50                                             | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 3            | 2              | 1,930        |
| 515 00                                                   | 550 00                                                      | 12                                 | 4                                | 13                       | .70                          | 65                                             | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 3            | 2              | 1,794        |
| 515 00                                                   | 550 00                                                      | 12                                 | $4\frac{1}{2}$                   | 13                       | .90                          | 80                                             | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 3            | 2              | 1,758        |
| 515 00                                                   | 550 00                                                      | 12                                 | 5                                | 13                       | 1.10                         | 100                                            | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 4            | 3              | 2,309        |
| 650 00                                                   | 725 00                                                      | 12                                 | 3                                | 25                       | .75                          | 40                                             | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 4            | 3              | 2,600        |
| 650 00                                                   | 725 00                                                      | 12                                 | $3\frac{1}{2}$                   | 25                       | 1.04                         | 50                                             | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 4            | 3              | 2,600        |
| 650 00                                                   | 725 00                                                      | 12                                 | 4                                | 25                       | 1.35                         | 65                                             | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 4            | 3              | 2,600        |
| 650 00                                                   | 725 00                                                      | 12                                 | $4\frac{1}{2}$                   | 25                       | 1.72                         | 80                                             | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 4            | 3              | 2,600        |
| 650 00                                                   | 725 00                                                      | 12                                 | 5                                | 25                       | 2.12                         | 100                                            | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 4            | 3              | 2,600        |
| 650 00                                                   | 725 00                                                      | 12                                 | 6                                | 25                       | 3.00                         | 150                                            | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 5            | 4              | 3,200        |
| 725 00                                                   | 800 00                                                      | 14                                 | $3\frac{1}{2}$                   | 25                       | 1.04                         | 50                                             | 2              | 3              | 4            | 3              | 3,100        |
| 725 00                                                   | 800 00                                                      | 14                                 | 4                                | 25                       | 1.35                         | 65                                             | 2              | 3              | 4            | 3              | 3,100        |
| 725 00                                                   | 800 00                                                      | 14                                 | $4\frac{1}{2}$                   | 25                       | 1.72                         | 80                                             | 2              | 3              | 4            | 3              | 3,500        |
| 725 00                                                   | 800 00                                                      | 14                                 | 5                                | 25                       | 2.12                         | 100                                            | 2              | 3              | 4            | 3              | 3,483        |
| 725 00                                                   | 800 00                                                      | 14                                 | 6                                | 25                       | 3.00                         | 150                                            | 2              | 3              | 5            | 4              | 3,500        |
| 1,025 00                                                 | 1,100 00                                                    | 16                                 | 4                                | 25                       | 1.35                         | 65                                             | $2\frac{1}{2}$ | 4              | 4            | 3              | 4,200        |
| 1,025 00                                                 | 1,100 00                                                    | 16                                 | $4\frac{1}{2}$                   | 25                       | 1.72                         | 80                                             | $2\frac{1}{2}$ | 4              | 4            | 3              | 4,200        |
| 1,025 00                                                 | 1,100 00                                                    | 16                                 | 5                                | 25                       | 2.12                         | 100                                            | $2\frac{1}{2}$ | 4              | 4            | 3              | 4,204        |
| 1,025 00                                                 | 1,100 00                                                    | 16                                 | 6                                | 25                       | 3.00                         | 150                                            | $2\frac{1}{2}$ | 4              | 5            | 4              | 4,205        |
| 1,125 00                                                 | 1,225 00                                                    | 18                                 | 4                                | 25                       | 1.35                         | 65                                             | 3              | 4              | 4            | 3              | 5,700        |
| 1,125 00                                                 | 1,225 00                                                    | 18                                 | $4\frac{1}{2}$                   | 25                       | 1.72                         | 80                                             | 3              | 4              | 4            | 3              | 5,700        |
| 1,125 00                                                 | 1,225 00                                                    | 18                                 | 5                                | 25                       | 2.12                         | 100                                            | 3              | 4              | 4            | 3              | 5,700        |
| 1,125 00                                                 | 1,225 00                                                    | 18                                 | 6                                | 25                       | 3.00                         | 150                                            | 3              | 4              | 5            | 4              | 5,700        |

## THE SNOW "PISTON PRESSURE" PUMPS

Fig. 5469



## VALVE-PLATE STYLE

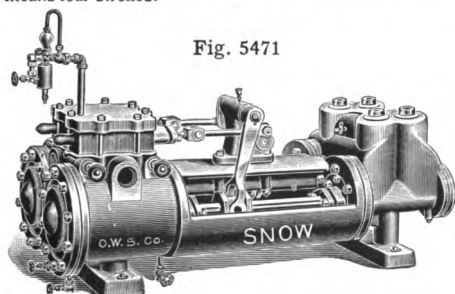
This pump is designed for working against a water pressure of 500 pounds per square inch. It differs from the regular "pressure" pump in that it has no outside packed plungers, but a piston packed with fibrous packing.

The pump cylinders are brass lined, unless ordered otherwise. These pumps are used extensively on oil lines and are especially adapted for pumping heavy oil.

| Diameter of steam cylinders | Diameter of pump pistons | Length of stroke | Gallons per revolution | Proper number of revolutions per minute | Gallons per minute | DIAMETER OF PIPES, INCHES |         |         |          | Weight, lbs. | Price    | Brass Fittings *(See Note) |
|-----------------------------|--------------------------|------------------|------------------------|-----------------------------------------|--------------------|---------------------------|---------|---------|----------|--------------|----------|----------------------------|
|                             |                          |                  |                        |                                         |                    | Steam                     | Exhaust | Suction | Delivery |              |          |                            |
| 6                           | 2½                       | 6                | .49                    | 50 to 80                                | 24.5 to 39.2       | 1                         | 1½      | 2½      | 2        | 800          | \$140 00 | 10 65                      |
| 6                           | 3                        | 6                | .7                     | 50 to 80                                | 35 to 56           | 1                         | 1½      | 2½      | 2        | 800          | 140 00   | 10 65                      |
| 6                           | 3½                       | 6                | .96                    | 50 to 80                                | 48 to 76.8         | 1                         | 1½      | 2½      | 2        | 800          | 150 00   | 10 65                      |
| 7                           | 2½                       | 8                | .65                    | 45 to 70                                | 29.3 to 45.5       | 1½                        | 2       | 2½      | 2        | 950          | 215 00   | 16 00                      |
| 7                           | 3                        | 8                | .94                    | 45 to 70                                | 42.3 to 65.8       | 1½                        | 2       | 2½      | 2        | 950          | 215 00   | 16 00                      |
| 7                           | 3½                       | 8                | 1.27                   | 45 to 70                                | 57.2 to 89         | 1½                        | 2       | 2½      | 2        | 950          | 230 00   | 16 00                      |

Sizes are designated by the diameter of the steam cylinders, the diameter of the pump pistons and the length of stroke. When pumps are fitted with brass piston rods a slight extra charge is made. NOTE.—One revolution means four strokes.

Fig. 5471



## VALVE-POT STYLE

This pump is designed for working against heavy pressures ranging from 300 to 1,000 pounds per square inch. It differs from the "piston pressure" pump with valve-plate in that it has regular pot valves accessible from the outside. The pump cylinders are brass lined, unless ordered otherwise.

The pumps are used extensively on oil lines and are especially adapted for pumping oil under heavy pressure.

| Diameter of steam cylinders | Diameter of pump pistons | Length of stroke | Gallons per revolution | Proper number of revolutions per minute | Gallons per minute | DIAMETER OF PIPES, INCHES |         |         |          | Weight, lbs. | Price    | Brass Fittings *(See Note) |
|-----------------------------|--------------------------|------------------|------------------------|-----------------------------------------|--------------------|---------------------------|---------|---------|----------|--------------|----------|----------------------------|
|                             |                          |                  |                        |                                         |                    | Steam                     | Exhaust | Suction | Delivery |              |          |                            |
| 6                           | 2½                       | 6                | .49                    | 50 to 80                                | 24.5 to 39.2       | 1                         | 1½      | 2½      | 2        | 900          | \$200 00 | 10 65                      |
| 6                           | 3                        | 6                | .7                     | 50 to 80                                | 35 to 56           | 1                         | 1½      | 2½      | 2        | 900          | 200 00   | 10 65                      |
| 6                           | 3½                       | 6                | .96                    | 50 to 80                                | 48 to 76.8         | 1                         | 1½      | 2½      | 2        | 900          | 220 00   | 10 65                      |
| 8                           | 3                        | 10               | 1.18                   | 40 to 65                                | 47.2 to 76.7       | 1½                        | 2       | 3       | 2        | 1,900        | 460 00   | 26 65                      |
| 10                          | 3                        | 10               | 1.18                   | 40 to 65                                | 47.2 to 76.7       | 2                         | 2½      | 3       | 2        | 2,000        | 490 00   | 26 65                      |
| 8                           | 3½                       | 10               | 1.6                    | 40 to 65                                | 64 to 104          | 1½                        | 2       | 3       | 2        | 1,900        | 460 00   | 26 65                      |
| 10                          | 3½                       | 10               | 1.6                    | 40 to 65                                | 64 to 104          | 2                         | 2½      | 3       | 2        | 2,000        | 490 00   | 26 65                      |
| 8                           | 4½                       | 10               | 2.64                   | 40 to 65                                | 105.6 to 171.6     | 1½                        | 2       | 4       | 3        | 1,900        | 490 00   | 33 35                      |
| 10                          | 4½                       | 10               | 2.64                   | 40 to 65                                | 105.6 to 171.6     | 2                         | 2½      | 4       | 3        | 2,000        | 520 00   | 33 35                      |

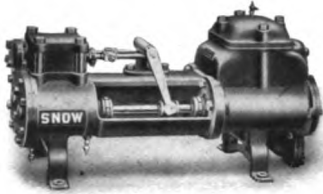
Sizes are designated by the diameter of the steam cylinders, the diameter of the pump pistons and the length of stroke. When pumps are fitted with brass piston rods a slight additional charge is made. NOTE.—One revolution means four strokes. Pump pressures in table are based on a pressure of 100 pounds in steam cylinders.

\* If Pumps with brass fittings are desired, add list price of Brass Fittings to net price of regular Pumps.



## THE SNOW DUPLEX BOILER-FEED PUMP

Fig. 5467



### OF SMALL SIZE, 1906 MODEL

This pump is the latest design of boiler feeder and for general service duty up to 150 pounds per square inch working pressure.

Sizes are designated by the diameter of the steam cylinders, the diameter of the pump plungers and the length of stroke.

Bed plates extra. When pumps are fitted with piston rods, a slight extra charge is made.

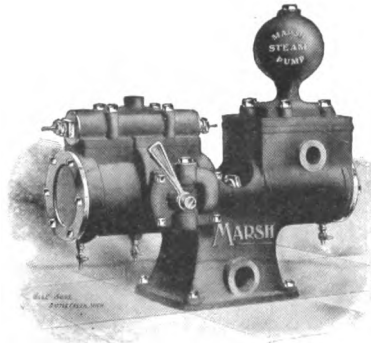
NOTE.—One revolution means one complete circuit of the motion of any of the reciprocating parts, and for a duplex pump is equivalent to four single strokes.

| Diameter of steam cylinders | Diameter of pump plungers | Length of stroke | Gallons per revolution | Proper number of revolutions per minute | Gallons per minute | DIAMETER OF PIPES, INCHES |         |         |           | Weight, lbs. | Price   | Brass fittings *(See Note) |
|-----------------------------|---------------------------|------------------|------------------------|-----------------------------------------|--------------------|---------------------------|---------|---------|-----------|--------------|---------|----------------------------|
|                             |                           |                  |                        |                                         |                    | Steam                     | Exhaust | Suction | Discharge |              |         |                            |
| 2                           | 1½                        | 2½               | .44                    | 80 to 150                               | 3.5 to 7.6         | 1                         | 1       | 1       | 1         | 75           | \$45 00 | —                          |
| 3                           | 2                         | 3                | .156                   | 50 to 125                               | 7.8 to 19.5        | 1                         | 1       | 1½      | 1½        | 120          | 55 00   | \$3 00                     |
| 4½                          | 2½                        | 4                | .392                   | 50 to 100                               | 19.6 to 39.25      | 1                         | 1       | 2       | 1½        | 320          | 90 00   | 7 00                       |
| 5½                          | 3½                        | 5                | .795                   | 50 to 90                                | 39.75 to 71.55     | 1                         | 1½      | 2½      | 2         | 500          | 120 00  | 9 35                       |
| 6                           | 4                         | 6                | 1.25                   | 50 to 80                                | 62.5 to 100        | 1                         | 1½      | 3       | 2         | 650          | 140 00  | 12 00                      |
| 7½                          | 4½                        | 6                | 1.59                   | 50 to 80                                | 79.5 to 127.2      | 1½                        | 2       | 4       | 3         | 800          | 195 00  | 18 65                      |

\*If Pumps with brass fittings are desired, add list price of Brass Fittings to net price of regular Pumps.

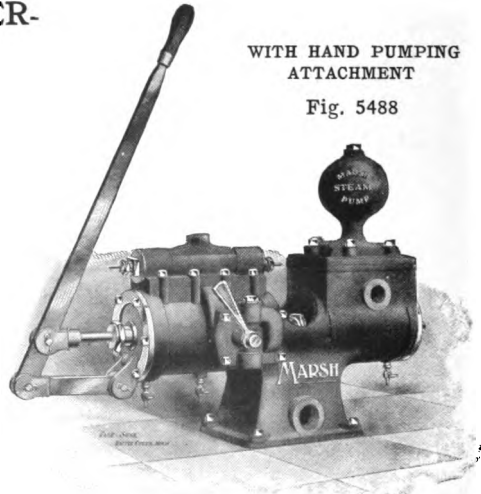
## THE MARSH BOILER-FEED PUMP

Fig. 5487



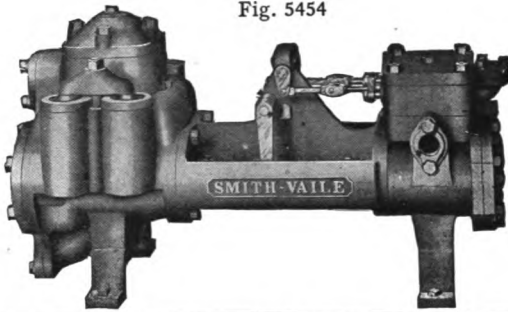
WITH HAND PUMPING ATTACHMENT

Fig. 5488



| Size | Steam Cylinder | Water Cylinder | Stroke | Gallons per hour | Floor space, inches | Weight, lbs. | Price, Fig. 5487 | Price, Fig. 5488 |
|------|----------------|----------------|--------|------------------|---------------------|--------------|------------------|------------------|
| B    | 2½             | 1              | 2      | 200              | 7 x 12              | 40           | \$30 00          | \$35 00          |
| BB   | 3              | 1½             | 2½     | 400              | 8 x 16              | 75           | 50 00            | 55 00            |
| C    | 4              | 2½             | 3      | 650              | 10 x 21             | 145          | 75 00            | 85 00            |
| D    | 5              | 3              | 3½     | 1,000            | 11 x 23             | 190          | 100 00           | 110 00           |

Fig. 5454

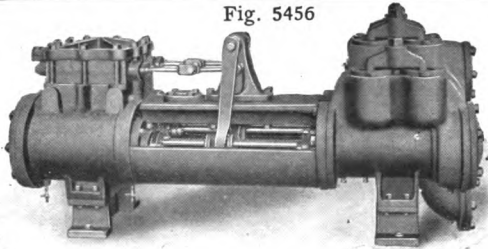


## SMITH-VAILE PUMP

DUPLIX PATTERN  
PISTON PACKED TYPE

| Diameter of steam cylinders, in. | Diameter of water cylinders, in. | Stroke, inches | Gallons, per revolution | Steam pipe, inches | Exhaust pipe, inches | Suction pipe, inches | Dis-charge pipe, in. | Weight, lbs. | Price   | Brass Fittings |
|----------------------------------|----------------------------------|----------------|-------------------------|--------------------|----------------------|----------------------|----------------------|--------------|---------|----------------|
| 3                                | 2                                | 4              | .2                      | $\frac{1}{2}$      | $\frac{3}{4}$        | $1\frac{1}{2}$       | 1                    | 255          | \$43 50 | \$3 25         |
| $4\frac{1}{2}$                   | $2\frac{3}{4}$                   | 4              | .48                     | $\frac{3}{4}$      | 1                    | 2                    | $1\frac{1}{2}$       | 560          | 65 00   | 7 50           |
| $5\frac{1}{2}$                   | $3\frac{1}{2}$                   | 5              | .8                      | $\frac{3}{4}$      | $1\frac{1}{2}$       | $2\frac{1}{2}$       | 2                    | 810          | 90 00   | 10 00          |
| 6                                | 4                                | 6              | 1.32                    | 1                  | $1\frac{1}{2}$       | 3                    | 2                    | 900          | 100 00  | 14 00          |
| 7                                | $4\frac{1}{2}$                   | 6              | 1.32                    | 1                  | $1\frac{1}{2}$       | 3                    | 2                    | 1,300        | 152 00  | 20 00          |
| 7                                | 4                                | 10             | 2.17                    | $1\frac{1}{2}$     | 2                    | 4                    | 3                    | 1,350        | 175 00  | 30 00          |
| 7                                | $4\frac{1}{2}$                   | 10             | 2.76                    | $1\frac{1}{2}$     | 2                    | 4                    | 3                    | 1,350        | 185 00  | 30 00          |
| 7                                | 5                                | 10             | 3.4                     | $1\frac{1}{2}$     | 2                    | 4                    | 3                    | 1,825        | 210 00  | 35 00          |
| 8                                | 5                                | 10             | 3.4                     | $1\frac{1}{2}$     | 2                    | 4                    | 3                    | 1,845        | 220 00  | 35 00          |
| 9                                | 6                                | 10             | 4.88                    | $1\frac{1}{2}$     | 2                    | 5                    | 4                    | 1,955        | 250 00  | 50 00          |
| 10                               | 6                                | 12             | 5.84                    | 2                  | $2\frac{1}{2}$       | 5                    | 4                    | 2,650        | 290 00  | 55 00          |
| 10                               | 7                                | 12             | 7.9                     | $2\frac{1}{2}$     | 3                    | 6                    | 5                    | 3,600        | 350 00  | 55 00          |
| 12                               | 8                                | 12             | 10.4                    | $2\frac{1}{2}$     | 3                    | 6                    | 5                    | 4,050        | 450 00  | 70 00          |
| 14                               | 10                               | 12             | 10.4                    | $2\frac{1}{2}$     | 3                    | 6                    | 5                    | 5,700        | 600 00  | 80 00          |

Fig. 5456

KNOWLES SPECIAL  
DUPLIX PUMP

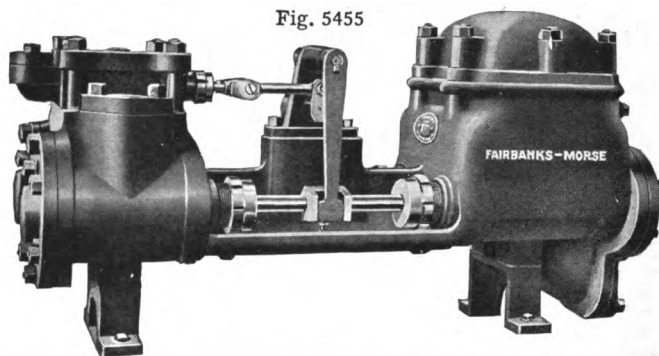
PRESSURE PATTERN  
FOR  
BOILER FEEDING, ETC.

| Steam Cylinders, inches | Water Cylinders, inches | Stroke, inches | Capacity in gallons per stroke each piston | Steam pipe, inches | Exhaust pipe, inches | Suction pipe, inches | Dis-charge pipe, inches | Weight, lbs. | Price   | Price brass fitted |
|-------------------------|-------------------------|----------------|--------------------------------------------|--------------------|----------------------|----------------------|-------------------------|--------------|---------|--------------------|
| 3                       | 2                       | 3              | .16                                        | $\frac{3}{4}$      | $\frac{1}{2}$        | $1\frac{1}{2}$       | 1                       | 150          | \$55 00 | \$60 00            |
| $4\frac{1}{2}$          | $2\frac{3}{4}$          | 4              | .40                                        | $\frac{3}{4}$      | $\frac{1}{2}$        | 2                    | 2                       | 320          | 90 00   | 100 00             |
| $5\frac{1}{2}$          | $3\frac{1}{2}$          | 5              | .80                                        | $\frac{3}{4}$      | $1\frac{1}{2}$       | $2\frac{1}{2}$       | $2\frac{1}{2}$          | 435          | 120 00  | 130 00             |
| 6                       | 4                       | 6              | 1.32                                       | 1                  | $1\frac{1}{2}$       | 3                    | 3                       | 565          | 140 00  | 156 00             |
| $7\frac{1}{2}$          | 5                       | 6              | 2.04                                       | $1\frac{1}{2}$     | $1\frac{1}{2}$       | 4                    | 3                       | 850          | 195 00  | 220 00             |
| $7\frac{1}{2}$          | $4\frac{1}{2}$          | 10             | 2.76                                       | $1\frac{1}{2}$     | $1\frac{1}{2}$       | 4                    | 3                       | 970          | 275 00  | 320 00             |
| 8                       | 5                       | 10             | 3.40                                       | $1\frac{1}{2}$     | 2                    | 4                    | 3                       | 1,875        | 365 00  | -----              |
| 10                      | 6                       | 10             | 4.88                                       | $1\frac{1}{2}$     | 2                    | 5                    | 4                       | 1,500        | 415 00  | 490 00             |
| 10                      | 6                       | 12             | 5.88                                       | $1\frac{1}{2}$     | 2                    | 5                    | 4                       | 2,700        | 510 00  | -----              |
| 10                      | 7                       | 10             | 6.64                                       | $1\frac{1}{2}$     | 2                    | 6                    | 5                       | 2,550        | 515 00  | 600 00             |
| 12                      | 7                       | 10             | 6.64                                       | $2\frac{1}{2}$     | 3                    | 6                    | 5                       | 3,660        | 615 00  | 690 00             |
| 14                      | $10\frac{1}{2}$         | 10             | 14.28                                      | $2\frac{1}{2}$     | 3                    | 8                    | 7                       | 5,145        | 800 00  | 910 00             |

The 8 x 5 x 10 and 10 x 6 x 12 pumps of these patterns are used extensively in connection with the hydraulic rotary drilling system.

# THE FAIRBANKS-MORSE DUPLEX BOILER FEED PUMP

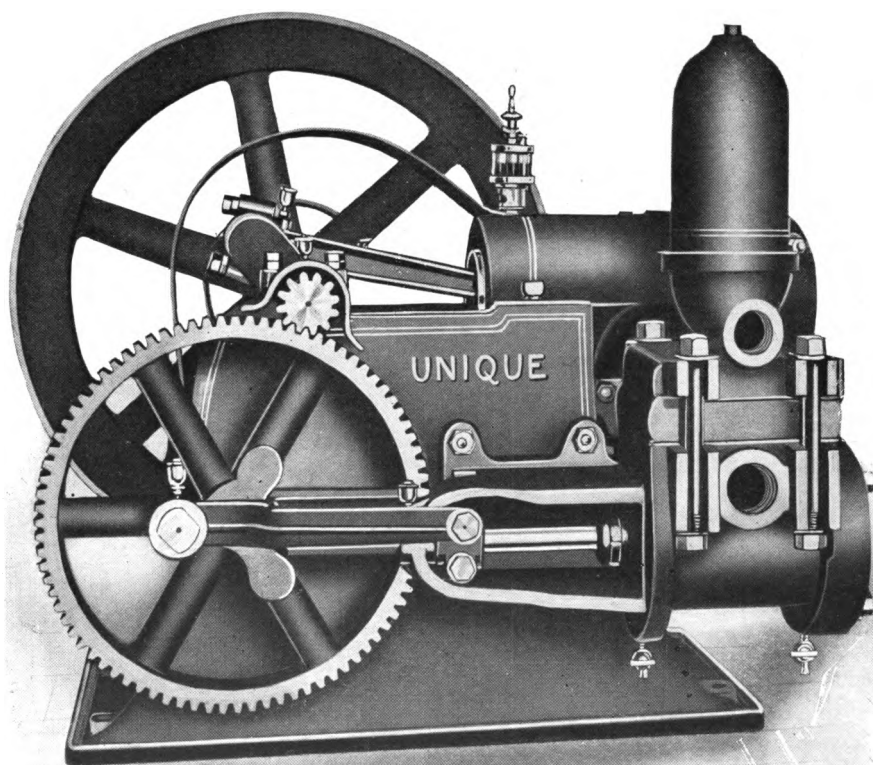
Fig. 5455



| Diameter of steam cylinders, inches | Diameter of water cylinder, inches | Length of stroke, inches | Gallons per stroke | DIAMETER OF PIPES, INCHES |                |                |                | Weight, lbs. | Price   |
|-------------------------------------|------------------------------------|--------------------------|--------------------|---------------------------|----------------|----------------|----------------|--------------|---------|
|                                     |                                    |                          |                    | Steam                     | Exhaust        | Suction        | Discharge      |              |         |
| 3                                   | 2                                  | 4                        | .05                | $\frac{3}{8}$             | $\frac{1}{2}$  | $1\frac{1}{4}$ | 1              | 210          | \$55 00 |
| $4\frac{1}{2}$                      | 3                                  | 4                        | .12                | $\frac{1}{2}$             | $\frac{3}{4}$  | 2              | $1\frac{1}{2}$ | 350          | 90 00   |
| $5\frac{1}{4}$                      | $3\frac{3}{4}$                     | 5                        | .20                | 1                         | $1\frac{1}{2}$ | $2\frac{1}{2}$ | $1\frac{1}{2}$ | 490          | 120 00  |
| 6                                   | 4                                  | 6                        | .33                | 1                         | $1\frac{1}{2}$ | 3              | 2              | 640          | 140 00  |
| 7                                   | $4\frac{1}{2}$                     | 7                        | .48                | $1\frac{1}{2}$            | 2              | 4              | 3              | 990          | 195 00  |
| 7                                   | $4\frac{1}{2}$                     | 10                       | .69                | $1\frac{1}{2}$            | 2              | 4              | 3              | 1,375        | 275 00  |
| 8                                   | 5                                  | 12                       | 1.02               | $1\frac{1}{2}$            | 2              | 4              | 3              | 1,610        | 300 00  |
| 10                                  | 6                                  | 12                       | 1.47               | 2                         | $2\frac{1}{2}$ | 5              | 4              | 3 125        | 440 00  |

## GAS ENGINE AND PUMP COMBINED

"UNIQUE". Fig. 5489



The pump will lift 40 barrels per hour to a height of 150'. It is direct connected to engine, but can be easily disconnected within one minute's time. It is an engine used for electric light or general power purposes. The engine is fitted with an 8" pulley, 4" face and has a speed from 325 to 425 revolutions per minute. The suction pipe is  $1\frac{1}{2}$ " and discharge  $1\frac{1}{4}$ " in diameter. It is automatically governed. For water supply, fire purposes, in mills, factories, country places, farm or home it stands without a peer.

**Weight 500 lbs.**

Further information on application.

Fig. 5452

**"JUPITER" DOUBLE-ACTING FORCE PUMP**

With air chamber and adjustable lever, especially adapted for elevating water from cisterns, etc., to tanks in upper stories of residences; also used largely for cleaning and filling boilers and for fire protection. Brass plugs are provided for draining cylinder to prevent freezing and for priming when necessary.

| No. | Diameter cylinder, inches | Stroke, inches | Suction fitted for pipe, inches | Discharge fitted for pipe, inches | Weight, lbs. | Iron    | Brass lined cylinder |
|-----|---------------------------|----------------|---------------------------------|-----------------------------------|--------------|---------|----------------------|
| 1   | 2½                        | 5              | 1½                              | 1                                 | 56           | \$16 00 | 18 00                |
| 2   | 3                         | 5              | 1½                              | 1½                                | 63           | 18 00   | 21 00                |

**PARTS FOR "JUPITER" DOUBLE-ACTING FORCE PUMP**

| For number - - -      | 1      | 2    | For number - - -       | 1      | 2    |
|-----------------------|--------|------|------------------------|--------|------|
| Cylinder - - - -      | \$4 00 | 5 00 | Lever - - - - -        | \$1 75 | 1 75 |
| Lower valve chest - - | 1 50   | 1 50 | Lever socket - - -     | 50     | 50   |
| Front head - - - -    | 1 00   | 1 00 | Link - - - - -         | 25     | 25   |
| Back head - - - -     | 75     | 75   | Brass valves - each    | 75     | 75   |
| Base - - - - -        | 1 50   | 1 50 | Suction tube and nut - | 1 00   | 1 00 |
| Air chamber - - - -   | 1 50   | 1 50 | Discharge nut and tube | 90     | 1 00 |
| Plunger - - - - -     | 1 00   | 1 00 | Brass stuffing box - - | 40     | 40   |
| Piston rod - - - -    | 3 00   | 3 00 |                        |        |      |

Fig. 5453

**THE MEYERS LOW DOWN DOUBLE-ACTING FORCE PUMP**

Weight, 87 lbs.

Complete with hose nipple, hose attachment, hose band and strainer.. \$15 00

**STEAM JET PUMP**

JARECKI PATTERN

Fig. 5449

| Size - - - - - inches | 1      | 1½   |
|-----------------------|--------|------|
| Weight - - - - - lbs. |        |      |
| Price - - - - -       | \$5 00 | 7 50 |



Fig. 5445

**STEAM JET PUMP**

OIL WELL SUPPLY PATTERN

| Size of pump - - - - inches       | ¾      | 1     | 1½    | 1½    | 2     | 2½    | 3     |
|-----------------------------------|--------|-------|-------|-------|-------|-------|-------|
| Suction pipe - - - - inches       | ¾      | 1     | 1½    | 1½    | 2     | 2½    | 3     |
| Discharge pipe - - - - inches     | ¾      | 1     | 1½    | 1½    | 2     | 2½    | 3     |
| Steam pipe - - - - - inches       | ¾      | 1     | 1½    | 1½    | 2     | 2½    | 3     |
| Steam opening - - - - inches      | ¾      | 1     | 1½    | 1½    | 2     | 2½    | 3     |
| Capacity per minute - - gallons   | 8      | 15    | 20    | 30    | 40    | 50    | 60    |
| Weight - - - - - lbs.             | 4      | 6     | 8     | 12    | 16    | 24    | 33    |
| Complete - - - - -                | \$8 00 | 10 00 | 12 00 | 14 00 | 16 00 | 20 00 | 24 00 |
| Nuts - - - - - each               | 50     | 50    | 75    | 75    | 1 00  | 1 50  | 1 50  |
| Malleable nipples - - - each      | 25     | 25    | 35    | 35    | 60    | 75    | 1 00  |
| Combination pipe(loose tubes)each | 75     | 75    | 75    | 1 00  | 1 00  | 1 50  | 1 50  |
| Steam tubes (tight tubes) - each  | 25     | 50    | 50    | 60    | 60    | 75    | 75    |

Fig. 5447

**JET PUMP FOR DRIVE WELLS**

| No. | Suction, inches | Delivery, inches | Discharge, inches | Size of pipe it will go in, inches | Delivery per hour in gallons | Price  | Weight, lbs. |
|-----|-----------------|------------------|-------------------|------------------------------------|------------------------------|--------|--------------|
| 1   | 1               | ¾                | ½                 | 3                                  | 500                          | \$7 50 | 1.5          |
| 2   | 1½              | 1                | ¾                 | 3½                                 | 1,000                        | 10 00  | 2            |
| 3   | 1½              | 1½               | 1                 | 4                                  | 1,500                        | 12 50  | 3            |
| 4   | 2               | 1½               | 1½                | 5                                  | 2,000                        | 15 00  | 3.8          |

# **GEOLOGICAL FORMATIONS OR "SANDS" IN WHICH OIL AND GAS ARE FOUND IN EASTERN AND CENTRAL NORTH AMERICA**

|               | Geological Series or Group     | Producing Horizons                                                    | Locality Where Productive                                       | Approx. depth below Pittsburgh Coal Feet |
|---------------|--------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------|
| CARBONIFEROUS | Lower Barren Coal Measures     | Goose Run Sand .....                                                  | S. E. Ohio .....                                                | 100 ft. above                            |
|               |                                | Pittsburgh Coal .....                                                 | Not Productive .....                                            | 0                                        |
|               |                                | Connellsville Sand .....                                              | West Virginia .....                                             | 40                                       |
|               |                                | Morgantown Sand .....                                                 | West Virginia .....                                             | 80                                       |
|               |                                | Macksburg Sandstone .....                                             | S. E. Ohio .....                                                | 200                                      |
|               |                                | Hurry-up Sand .....                                                   | S. W. Penna. and W. Va. ....                                    | 300                                      |
|               | Lower Productive Coal Measures | First Cow Run Sand .....                                              | S. W. Penna. and W. Va. ....                                    | 320                                      |
|               |                                | Mahoning Sandstone .....                                              | S. W. Penna. and W. Va. ....                                    | 350                                      |
|               |                                | Middle Cow Run Sand or Freeport Sandstone .....                       | S. W. Penna., West Va. and S. E. Ohio .....                     | 450                                      |
|               |                                | Upper Second Cow Run Sand .....                                       | S. W. Penna., West Va. and S. E. Ohio .....                     | 600                                      |
|               |                                | Lower Second Cow Run Sand .....                                       | S. W. Penna., West Va. and S. E. Ohio .....                     | 650                                      |
|               |                                | Tionesta, Homewood or 700 ft. Macksburg Sand .....                    | S. W. Penna., West Va., S. E. Ohio and Kentucky .....           | 850                                      |
|               | Pottsville                     | Upper Connoquenessing 800 ft. Macksburg Sand or Upper Salt Sand ..... | S. W. Penna., West Va., S. E. Ohio and Ky. ....                 | 925                                      |
|               |                                | Lower Connoquenessing or Middle Salt Sand .....                       | S. W. Penna., West Va., S. E. Ohio and Ky. ....                 | 1,000                                    |
|               |                                | Lower Salt Sand, Sharon or Olean Conglomerate or Maxon Sand .....     | S. W. Penna., West Va., S. E. Ohio, Kansas and Indian Ter. .... | 1,080                                    |
|               |                                | Mauch Chunk                                                           |                                                                 | 1,275                                    |
|               | Pocono                         | Keener Sandstone .....                                                | S. E. Ohio and West Va. ....                                    | 1,275                                    |
|               |                                | Big Injun Sand .....                                                  | S. W. Penna., West Va., S. E. Ohio and Ky. ....                 | 1,340                                    |
|               | DEVONIAN                       | Squaw Sand .....                                                      | S. W. Penna., West Va., S. E. Ohio and Ky. ....                 | 1,425                                    |
|               |                                | Upper Gas Sand .....                                                  | S. W. Pennsylvania .....                                        | 1,535                                    |
|               |                                | Berea Grit or Butler County Gas Sand .....                            | S. W. Penna., West Va., S. E. Ohio and Ky. ....                 | 1,700                                    |
|               |                                | Devonian or Ohio Shales (Gas) .....                                   | New York, N. W. Pa., Ky., N. E. Ohio and So. Ind. ....          | 1,780                                    |
|               |                                | First, 100 foot or Gantz Sand .....                                   | W. Penna., West Va. and S. E. Ohio .....                        | 1,850                                    |
|               |                                | 50 foot or Red Valley Sand .....                                      | W. Penna. and W. Va. ....                                       | 1,885                                    |
|               |                                | Second or 30 foot Sand .....                                          | W. Penna. and W. Va. ....                                       | 2,000                                    |
|               |                                | Stray or Boulder Sand .....                                           | W. Penna. and W. Va. ....                                       | 2,050                                    |
|               |                                | Third or Gordon Sand .....                                            | W. Penna., West Va. and S. E. Ohio .....                        | 2,130                                    |
|               |                                | Stray Third Sand .....                                                | W. Penna. and W. Va. ....                                       | 2,150                                    |
|               |                                | Fourth Sand .....                                                     | S. W. Penna. and W. Va. ....                                    | 2,200                                    |
|               |                                | Fifth Sand .....                                                      | S. W. Penna. and W. Va. ....                                    | 2,260                                    |
|               |                                | Bayard Sand .....                                                     | S. W. Penna. and W. Va. ....                                    | 2,420                                    |

## GEOLOGICAL FORMATIONS OR "SANDS" IN WHICH OIL AND GAS ARE FOUND IN EASTERN AND CENTRAL NORTH AMERICA—Concluded

|          | Geological Series or Group | Producing Horizons                      | Locality where Productive                                                    | Approx. depth below Pittsburgh Coal Feet |
|----------|----------------------------|-----------------------------------------|------------------------------------------------------------------------------|------------------------------------------|
| DEVONIAN | Middle Devonian            | Sixth or Elizabeth Sand.....            | S. W. Penna. and W. Va....                                                   | 2,590                                    |
|          |                            | Warren First Sand.....                  | N. W. Pennsylvania.....                                                      | 2,700                                    |
|          |                            | Warren Second Sand.....                 | N. W. Pennsylvania.....                                                      | 2,815                                    |
|          |                            | Warren Third Sand.....                  | N. W. Pennsylvania.....                                                      | 2,900                                    |
|          |                            | Clarendon Tiona Sand.....               | N. W. Pennsylvania.....                                                      | 2,950                                    |
|          |                            | Speechley Sand.....                     | N. W. Pennsylvania.....                                                      | 3,020                                    |
|          |                            | Cherry Grove or Garfield Sand.....      | N. W. Penna. and W. New York.....                                            | 3,150                                    |
|          |                            | Sheffield or Gusher City Sand.....      | N. W. Penna. and W. New York.....                                            | 3,350                                    |
|          |                            | Deer Lick Sand.....                     | N. W. Penna. and W. New York.....                                            | 3,420                                    |
|          |                            | Bradford Sand.....                      | N. W. Penna. and W. New York.....                                            | 3,460                                    |
|          |                            | Waugh and Porter Sands.....             | N. W. Penna. and W. New York.....                                            | 3,600                                    |
|          |                            | Elk County Sand.....                    | N. W. Penna. and W. New York.....                                            | 3,670                                    |
|          | Lower Devonian             | Kane Sand.....                          | N. W. Penna. and W. New York.....                                            | 3,860                                    |
|          |                            | Black Shales.....                       | N. W. Ky. and So. Ind.....                                                   | 5,325                                    |
|          |                            | Hamilton Limestone.....                 | Petrolia and Oil Springs, Ontario, Canada.....                               | 5,330                                    |
|          |                            | Carniferous Limestone.....              | N. E. and Central Ohio, W. N. Y., and Petrolia and Oil Springs, Ontario..... | 5,625                                    |
|          |                            | Oriskany Sandstone.....                 | N. Y., So. Indiana, Ontario.....                                             | 5,660                                    |
|          |                            | Guelph Limestone.....                   | So. Ontario and W. N. Y.....                                                 | 5,700                                    |
| SILURIAN | Silurian                   | Niagara Limestone.....                  | W. N. Y., Ind. and Ontario.....                                              | 5,820                                    |
|          |                            | Clinton Limestone.....                  | Cen. Ohio and Welland County, Ontario.....                                   | 5,985                                    |
|          |                            | Clinton Sandstone.....                  | County, Ontario.....                                                         | 6,025                                    |
|          |                            | Medina Red Sandstone.....               | W. N. Y. and Welland County, Ontario.....                                    | 6,085                                    |
|          |                            | Medina Upper White Sand.....            | W. N. Y. and Welland County, Ontario.....                                    | 6,185                                    |
|          |                            | Medina Lower White Sand.....            | W. N. Y. and Welland County, Ontario.....                                    | 6,240                                    |
|          | Cambro-Silurian            | Upper Trenton Limestone.....            | N. W. O., Ind. and Ky.....                                                   | 8,700                                    |
|          |                            | Lower Trenton Limestone.....            | W. N. Y. and Welland County, Ontario.....                                    | 9,200                                    |
|          |                            | Calcliferous and Potsdam Sandstone..... | W. N. Y., Ga., Ala., Ontario, Canada.....                                    |                                          |
|          |                            | Quebec Group.....                       | Newfoundland.....                                                            | 9,230                                    |

## SPECIFIC GRAVITY OF CRUDE OIL AND METHOD OF FINDING IT

The instruments used are a hydrometer and a standard thermometer. The hydrometer, which is a glass column marked with graduations from 10 to 100, was invented by Antoine Beaume, a French chemist, and the scale on the instrument has always borne his name. The hydrometer when placed in a jar or a bottle of oil, sinks to the point on the scale which indicates the gravity in degrees Beaume. The basis of temperature for testing oil is 60 degrees Fahrenheit and for oil at a greater or less temperature, variations must be calculated. Hydrometers are usually provided with a special scale for figuring temperature variations. The specific gravity is found by dividing 140 by 130 plus the Beaume degrees, for example: if the hydrometer registers 30°, this added to 130 equals 160, which divided into 140 shows specific gravity .875°.

Following is a table showing Beaume degrees, specific gravity and weight per gallon of oil.

| Degrees<br>Beaume | Degrees<br>Specific<br>Gravity | Weight<br>per Gallon,<br>Pounds | Degrees<br>Beaume | Degrees<br>Specific<br>Gravity | Weight<br>per Gallon,<br>Pounds | Degrees<br>Beaume | Degrees<br>Specific<br>Gravity | Weight<br>per Gallon,<br>Pounds |
|-------------------|--------------------------------|---------------------------------|-------------------|--------------------------------|---------------------------------|-------------------|--------------------------------|---------------------------------|
| 10                | 1.0000                         | 8.33                            | 32                | .8641                          | 7.20                            | 54                | .7608                          | 6.34                            |
| 11                | .9929                          | 8.27                            | 33                | .8588                          | 7.15                            | 55                | .7567                          | 6.30                            |
| 12                | .9859                          | 8.21                            | 34                | .8536                          | 7.11                            | 56                | .7526                          | 6.27                            |
| 13                | .9790                          | 8.16                            | 35                | .8484                          | 7.07                            | 57                | .7486                          | 6.24                            |
| 14                | .9722                          | 8.10                            | 36                | .8433                          | 7.03                            | 58                | .7446                          | 6.20                            |
| 15                | .9655                          | 8.04                            | 37                | .8383                          | 6.98                            | 59                | .7407                          | 6.17                            |
| 16                | .9589                          | 7.99                            | 38                | .8333                          | 6.94                            | 60                | .7368                          | 6.14                            |
| 17                | .9523                          | 7.93                            | 39                | .8284                          | 6.90                            | 61                | .7329                          | 6.11                            |
| 18                | .9459                          | 7.88                            | 40                | .8235                          | 6.86                            | 62                | .7290                          | 6.07                            |
| 19                | .9395                          | 7.83                            | 41                | .8187                          | 6.82                            | 63                | .7253                          | 6.04                            |
| 20                | .9333                          | 7.78                            | 42                | .8139                          | 6.78                            | 64                | .7216                          | 6.01                            |
| 21                | .9271                          | 7.72                            | 43                | .8092                          | 6.74                            | 65                | .7179                          | 5.98                            |
| 22                | .9210                          | 7.67                            | 44                | .8045                          | 6.70                            | 66                | .7142                          | 5.95                            |
| 23                | .9150                          | 7.62                            | 45                | .8000                          | 6.66                            | 67                | .7106                          | 5.92                            |
| 24                | .9090                          | 7.57                            | 46                | .7954                          | 6.63                            | 68                | .7070                          | 5.89                            |
| 25                | .9032                          | 7.53                            | 47                | .7909                          | 6.59                            | 69                | .7035                          | 5.86                            |
| 26                | .8974                          | 7.48                            | 48                | .7865                          | 6.55                            | 70                | .7000                          | 5.83                            |
| 27                | .8917                          | 7.43                            | 49                | .7821                          | 6.52                            | 75                | .6829                          | 5.69                            |
| 28                | .8860                          | 7.38                            | 50                | .7777                          | 6.48                            | 80                | .6666                          | 5.55                            |
| 29                | .8805                          | 7.34                            | 51                | .7734                          | 6.44                            | 85                | .6511                          | 5.42                            |
| 30                | .8750                          | 7.29                            | 52                | .7692                          | 6.41                            | 90                | .6363                          | 5.30                            |
| 31                | .8695                          | 7.24                            | 53                | .7650                          | 6.37                            | 95                | .6222                          | 5.18                            |



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